American Cinematographer

A.S.C. MAGAZINE



January 1930

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Paul Whiteman

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A technical and educational publication, espousing progress and art in motion picture photography.

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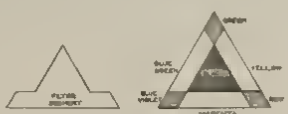
PRINCIPLES AND PROCESSES OF PHOTOGRAPHY IN NATURAL COLORS

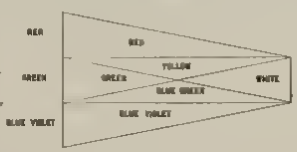
An Interesting and Instructive Discussion of Color in Photography

By GLENN E. MATTHEWS
Kodak Research Laboratories Rochester N Y

{ This article reprinted from the 1930 edition of the American Annual of Photography will be printed in two installments The next will be in the February issue —Editor's Note }

MANY hundreds of color processes have been patented and some few placed on the market since May, 1861, when Maxwell demonstrated the first process of color photography Only three of these processes, however, have withstood the test of over twenty years of continuous use namely, three-color litbography three color carbon transfer, and the Autochrome screen plate process On the other band during this same half century ordinary photography has become almost indispensable as a recording medium is extensively used in business advertising and through the motion pictures constitutes one of our most important forms of entertainment and instruction





Right fig 2 left fig 6

During the years 1928 1929 a renewed interest has been developing in color photography It has found considerable use in connection with the development of sound motion pictures A new process for amateur cinematography was announced during the late summer of 1928 which has been employed extensively in 1929 A color roll film and film pack method was exploited in England during the same year and several professional photographers in various parts of the world were specializing in commercial color prints A staff of workers has been in the field making color transparencies chiefly with the Autochrome process which are reproduced each month in the National Geographic Magazine and other magazines In view of this increased interest in the subject this article has been prepared to give a short review of the principles underlying the processes of color photography and to describe those processes which have found some practical application

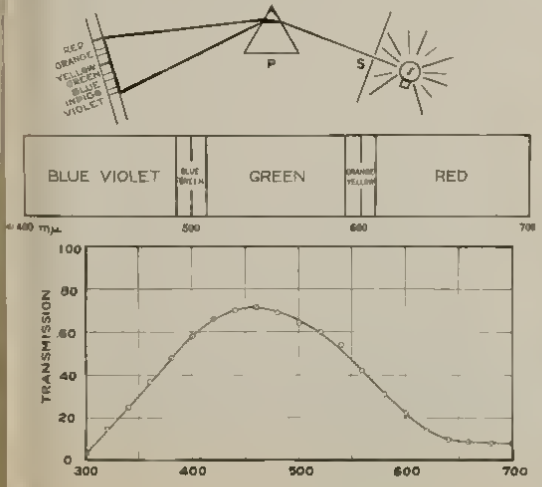
Color and Its Relation to Light

In the making of a photograph of any subject light is needed for illumination, a light sensitive material and a camera for recording and making it permanent The requirements in color photography are similar with certain modifications in order that the final record may be in colors To better understand the problem let us examine the known facts about color in relation to light

Most everyone is somewhat familiar with the subject of radio whereby sounds are changed from a frequency of vibration and wave-length sensitive to the ear to a much higher frequency suitable for broadcasting Similarly light may be considered to be when a ray of white light (usually sunlight) is passed through a narrow slit and then either through a prism or through an interference grating (a glass surface ruled with several thousand fine lines to the inch) the light is broken up into a multicolored ribbon or band known as the visible spectrum (Fig 1) The normal eye sees this band as an almost infinite number of hues, seven of which Newton distinguished as the most prominent made up of a series of complex waves of varying frequency violet indigo blue, green yellow, orange and red The light rays producing each minute portion of this band have a definite wave-length and therefore the color which the normal eye sees may be expressed in terms of a wave-length of about 400 mu (millionth of a millimeter or one-twenty-five millionths of an inch) in the violet to about 700 mu in the red (Fig 2)

Why Natural Objects Appear Colored

Consider now three strips of cardboard colored red green and blue respectively To the normal eye the strips will appear to be red, green, and blue when illuminated with white light because they absorb respectively all other colors of the light falling on them and reflect only these three colors This pro-



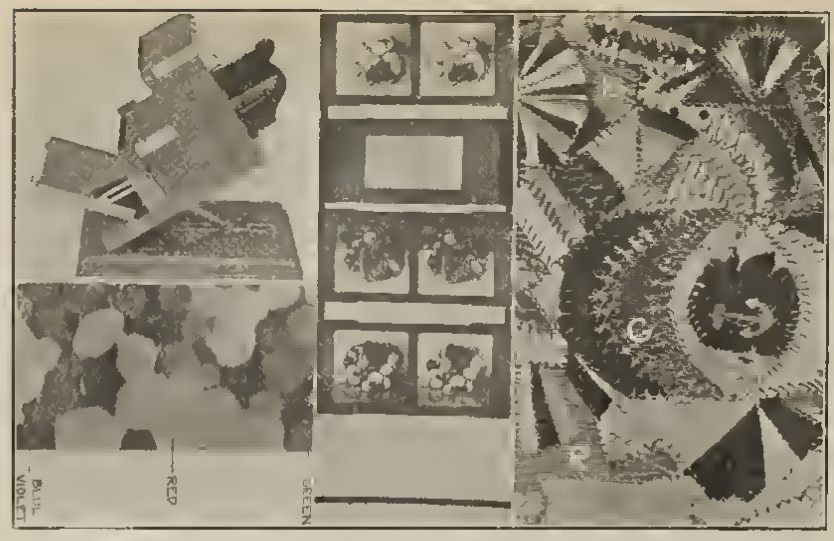
Top fig 1 bottom fig 3 middle fig 5



Fig 4 Wedge spectrum of ordinary Orthochromatic and Panchromatic films showing range of sensitivity.

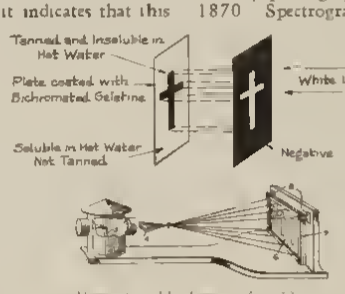
perty of absorbing certain components of white light and transmitting or reflecting others is characteristic of all natural objects When all the white light is absorbed the object appears black when all the components of white light are reflected in the same proportion the object appears white

When certain dyes are dissolved in water or alcohol they produce a solution having a color which is characteristic for the particular dye used It is also possible to obtain a numerical measurement of the light absoption properties of a dye solution by means of certain instruments When the results are plotted in terms of the percentage light transmission against the wave-length a curve is obtained which shows the absorption characteristics of the dye solution In Fig 3 the area above the curve represents complete absorption of light and that below the curve shows transmission of light Since the greatest transmission occurs at 460 mu in the green part of the spectrum it indicates that this dye gives a green solution



(Illustrations fig 7, upper center fig 8 right fig 9 lower left fig 10 lower center fig 13

By choosing only those dyes which transmit certain portions of the spectrum incorporating these in a solution of gelatin and coating this gelatin dye solution on the surface of a glass plate thin sheets of colored gelatin called "color filters" can be prepared Such filters have found extensive and valuable use in connection with color photography

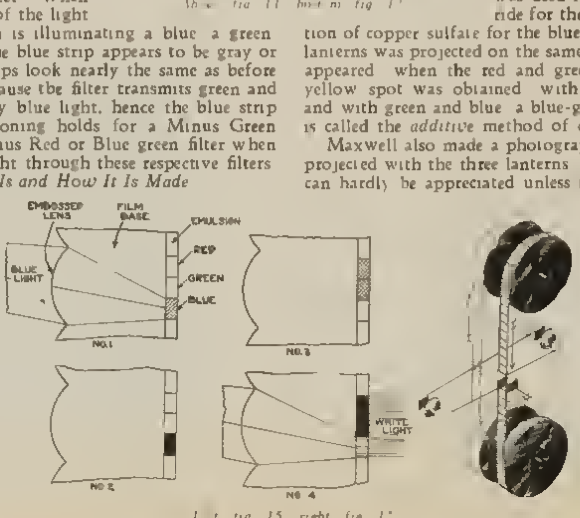


(Illustrations fig 11 bottom fig 1"

With the aid of one series of color filters called the "Minus Series" some very interesting effects may be produced Consider first, the Minus Blue filter When this filter is placed in the path of the light from a lantern projector which is illuminating a blue a green and a red strip of cardboard, the blue strip appears to be gray or black and the red and green strips look nearly the same as before the filter was used This is because the filter transmits green and red light, but does not pass any blue light, hence the blue strip appears black Analogous reasoning holds for a Minus Green or Magenta filter and for a Minus Red or Blue green filter when the cards are illuminated with light through these respective filters

What an Ordinary Photograph Is and How It Is Made

Since practically every color process uses a photographic film or plate for recording the tones of the subject let us examine briefly the characteristic properties of this medium If we look at a thin section of an unexposed photographic film under the microscope we find that it consists of two layers a thin layer of gelatin in which are embedded tiny crystals of silver halides and a much thicker transparent layer which is known as the base or support These tiny crystals are so small that even in the coarsest emulsions (suspensions of silver halides in gelatin) there are about ten million in an area the size of a head of a pin When exposed to light these crystals may be developed by means of a reducing solution whereupon they are changed into coke-like masses of silver The ordinary photographic image is made up of these minute particles of silver



(Illustrations fig 15 right fig 1"

Now, photographic emulsions vary in their sensitiveness to different colors of light It is only within the last twenty-five years that films have been available which are sensitive to red and green light as well as blue light Such materials are called *panchromatic* whereas if they are sensitive chiefly to the blue and the green they are known as *orthochromatic* Materials which have only blue sensitiveness are called *ordinary* materials Wet collodion plates were of this last type and were used by photographers until the dry plate was introduced about 1870 Spectrograms for these three types of materials are shown in Fig 4

Primary Colors and Their Relation to Photographic Sensitivity

Processes of color photography all date back to the classic experiment of Clerk Maxwell before the Royal Institution, London, in May 1861 On this occasion Maxwell demonstrated that any shade of colored light could be produced by combining various amounts of three primary colors, red, green and blue-violet He used three separate lanterns and placed colored solutions before the lens of each Ferric sulfocyanide was used for the red solution, cupric chloride for the green, and an ammoniacal solution of copper sulfate for the blue When the light from all three lanterns was projected on the same spot on the screen, a white area appeared when the red and green beams were superimposed a yellow spot was obtained with red and blue a magenta spot and with green and blue a blue-green spot (See Fig 5) This is called the *additive* method of color photography

Maxwell also made a photograph of a colored ribbon which he projected with the three lanterns The importance of his discovery can hardly be appreciated unless it is recalled that he was of necessity using wet collodion plates Eight years after Maxwell's demonstration a small French booklet was published in Paris written by Ducos du Hauron This contained a description of most all the basic principles of color processes which have subsequently been worked out Credit should therefore be given this French inventor for his foresight In the intervening years until his death in 1920 he continued to experiment and work out further details of color processes but he was

(Continued on Page 22)

THE EARLY HISTORY OF WIDE FILMS

Being a Peek into the Past that is Both Interesting and Enlightening

By CARL LOUIS GREGORY

*One of the most interesting papers read at the recent meeting of the S M P E was Mr Gregory's article an extract of which we are pleased to give our readers —*EDITOR'S NOTE

IT HAS been claimed that there is only one standard of measurement which is common to all nations of the earth That measurement is the width of a piece of standard theatrical size motion picture film

Many persons actively engaged in the industry seem to be unaware that other widths and dimensions of film were ever used and some even believe that the use of wide film is a recent invention.

History moves in cycles and recent events in the use of the wide film of various gauges show that we are in the midst of a repetition of the unstandardized efforts and struggles that marked the work of so many of the early pioneers of the industry.

To those who have never had occasion to refer to the early history of the motion picture it may come as a surprise that scores of scientists, mechanics and inventors in nearly every civilized country were working simultaneously during the "90's" to perfect a system for taking and showing motion pictures and while they were all, in the main, working along the same lines, yet each adopted whatever width of film seemed to him to be best suited for his experiments.

That the 35 mm width of film came to be the measurement which survived and eventually became standardized is, so far as the writer has been able to ascertain, a coincidence It was not foresight that caused Mr Edison in this country and Lumiere Freres in France to select film widths that were so nearly the same that they were practically interchangeable It was pure chance also, that these two firms happened to be the most powerful commercially in their respective countries

Edison selected 1⅜ inches as the width of film best suited for his Kinetoscope only after a long series of experiments with films in cylinders discs and narrow ribbon form run horizontally instead of vertically.

This measurement coincides within 1/1000 of an inch with the 35 mm width selected by Lumiere and while Lumiere used only one round perforation on each side of the film and Edison used four rectangular ones it was possible by altering sprockets or by reperforating the Lumiere film to use them interchangeably Lumiere later reluctantly abandoned the two-hole perforation and copied the Edison standard in order to sell film to users of Edison machines

An advertisement in Hopwood's Living Pictures edition of 1899 offers the Prestwich' specialties for animated photography— nine different models of cameras and projectors in three sizes for ½-inch 1⅜-inch and 2⅜-inch width of film Half a dozen other advertisers in the same book offer 'cinematographs' for sale and while the illustrations show machines for films obviously of narrow or wide gauge no mention is made of the size of the film

During 1899 there were in England and on the Continent Autograph films 2¾ inches wide Demeny Chronophotographe 60 mm wide, Skladowsky film 65 mm wide Prestwich wide film 2⅜ inches wide Biric films 11/16 inch wide, Junior Prestwich ½ inch wide, besides the present standard established by Paul, Edison and Lumiere



Henry V. Hopwood in 1899 described more than fifty different models of projectors made by different manufacturers and gives the names of about seventy more Curiously enough the size of film used in the various machines is mentioned only in two or three instances It is probable that most of them used the Edison standard although it is obvious from the descriptions that many of them used other sizes

Probably the first example of motion picture "film" as it is photographed today was a scene taken in the Champs Elysees in Paris in 1886 by Dr E J Marey. Although the "film" was paper, sensitized celluloid not being available until a year or two later, and cine projectors having not yet been invented; this paper negative could be printed as a positive film and run as a Fox Grandeur film today.

In May, 1889, William Friese-Green, 92, Piccadilly, London, made a motion picture negative of a scene on the Esplanade, Brigbton, England, using paper film negative 2½ inches wide and 1½ inches height to each frame. Later in the same year he used celluloid film displacing the paper used earlier.

One of the first to project successfully upon a large sized screen was Mr. Woodville Latham, inventor of the Latham Loop which caused much patent litigation in the early days Latham called his machine the Eidoloscope and used wide film 2 inches wide with frames ¾-inch high by 1½ inches long.

Oval holes cut through the frame line at eath side alternately served to make electrical contact to light the arc each time the intermittent brought the picture to rest This intermittent lighting of the arc served in place of a shutter but was not very successful as the electrical spring contacts scratched the film and the arc responded irregularly to the quick make and break.

In the fall of 1897 Enoch J Rector, an inventor and promoter, showed pictures of the Corbett-Fitzsimmons prize fight in the Academy of Music on 14th Street in New York City. His apparatus was called the Veriscope and the same mechanism used to show the pictures was employed in the camera with which 11 000 feet of film were taken at Carson City Nevada March 17, 1897 Thereafter about twenty machines for projecting this large size film were manufactured and these fight films were exhibited all over the country

In the late 90's the motion picture was regarded as a great novelty which would soon die out Conditions were chaotic and everyone who went into the business worked with frantic eagerness to reap the rich harvest before the fickle interest of the public should pass on to some new fancy

Just as there was no standard of film size no rate of frames per second was established and the taking rate varied from 8 per second to 60 per second among the different systems, each of which was distinguished by some fantastic and polysyllabic name Out of the hundreds of such coined trade names only a few are remembered today, such as Kinetoscope, Vitagraph, Biograph and Mutoscope

Subjects were confined almost entirely to news events, prizefights, short scenic shots and theatrical or spectacular hits many of which were considered

(Continued on Page 29)

THE KING OF JAZZ

Paul Whiteman Makes a Few Remarks Anent The Talking Pictures

By HAL HALL

THERE is nothing quite so enlightening to one in the picture business as the reaction of a stranger who has suddenly found himself in the midst of a production, especially if the individual is one with a mind as astute as that of Paul Whiteman the Maestro of Jazz

Whiteman always has had unusual ideas regarding the show business as a whole and he does not disappoint in connection with his thoughts about pictures or talkies as they are usually called now Instead of swelling up with his own importance now that he has been made the star of a picture that will cost probably a couple of million dollars or more he declares that he means nothing to the picture and the picture world unless his picture is good and the music is better

This Jazz King who is starring with his band in Universal's King of Jazz Revue" now in production at the Universal studios in Hollywood has some rather pointed remarks to make regarding pictures and picture making

Standing out among his remarks are the following:

Talkies have removed the orchestras from the picture houses but these same talkies will put the orchestras right back again within the next two years

Talkies will do much to develop the love for music among the people wherever they are exhibited whether in the United States or in foreign countries. And talkies will bring about the end of the four and five piece bands and orchestras that used to hold forth in the theatres in the past

The talkies are here to stay but—they will not eliminate the spoken drama or the bands and orchestras Rather they will make the people hungry for a sight of the players and musicians they have heard but who have been merely shadows flickering across a screen

While talkies are here to stay, there should and probably will be some great silent pictures made in the future Such men as Chaplin should never make a talkie He is too great a pantomimist

The art of the cinematographer is so amazing as to make one say it is unbelieveable that a man can do so much with a camera and some lights

The producers threw away the better part of two years development in sound recording by failing to turn immediately to men versed and long experienced in recording music and voice in the great phonograph laboratories

Whiteman said a lot more as he talked across the lunch table with this writer at Universal's studios and while we may be no judge of such things it strikes us that some picture company would be showing excellent judgment if it secured this man Whiteman solely in the capacity of a 'horse sense' adviser

The name of Paul Whiteman means nothing," he declared, 'as far as the success of the picture is concerned—that is unless the picture is a really good one itself The idea that producers have about big names is more or less a lot of bunk A big name will never make a success out of a poor picture It will draw a full house the first night yes but if the picture is no good the world will say Isn't that a terrible picture So-and-So is in?' And then everyone will stay away from the picture and it will flop all over the lot That has happened in silent pictures and has already happened in talkies

So why should either the star or the producer kid himself into believing something that isn't so Personally I believe our picture is going to be an excellent one The sound is simply marvelous the action is good The dialogue is good The music reproduces magnificently And the photography is simply gorgeous Hal Mohr certainly knows cinematography and lighting It is amazing the results he gets I would not have believed that a man with lights and a camera could do the things he does It seems to me that the cinematographe are not given sufficient prominence for the really wonderf work that they do in making pictures successful.

Getting to talkies and music let me say that I think talki will do much for music The people of the world have bee music hungry for years They have flocked miles to hear banc and orchestras I have toured the entire United States an played in practically every town of any size and people simpl flocked in They want music Why, down in Texas it too me six weeks before I could leave the state and you know ho scattered are the towns down there

'Abroad it is the same way They want music The will pay a lot to hear it Now with the motion pictur giving them this music it will simply cultivate their taste fo more But—they will not be satisfied with the pictures an music given in that way alone They will want to see th bands For that reason I say that within two years you wi see the bands and orchestras back in the picturehouses agai The talkies drove them out but will make the people so mus loving that they will have to put the bands back.

'And—I think that pictures with music will make th people demand big bands and good bands They won't stan for four and five piece affairs again They will be educate up to the big band with class And watch big bands com back to the theatres A good band can make a house pay eve if the picture is bad Big theatre chains have been built u by music It will be done again But people will not be sat isfied with canned music alone Never think that Picture are here to stay and they will be mostly talkies but peop want human beings to look at after a certain time

'Recording is just beginning to get into its stride in th picture business But the producers wasted the better pa of two years of development by not bringing out men lon experienced in recording in the big phonograph laboratorie Why it seems unbelieveable to me but it is a fact the picture people thought they did not need men who knew a about recording The result was terrible at first Everyor knows that But gradually the knowledge was gained at muc expense and now there should be some good recording I cannc understand why the producers failed to bring in the record ing men however

You might not believe it but one big producing genit was preparing to build a couple of huge sound stages I wa talking with him and started to tell him about the experienc I had had in building a sound recording laboratory I kne he was making a mistake He just laughed at me and aske me if I knew more than the electrical engineers who wa laying out the place I laughed too and said I didn't Bu nearly a quarter of a million dollars was wasted in those stage and they had to be changed A man versed in recording coul have avoided that

Whiteman laughed heartily when he recalled that experienc And then declared that at Universal they are really doin wonders in recording

'They are getting results here' he declared "marvelou results"

Whiteman declares that the so called jazz of today is reall the American music He points out that it is America's con tribution to the field of music and a good contribution too The classical music he points out has come from Europe bu America has developed the popular or jazz music which ha taken a firm hold in Europe Pictures he declares, will implan this American music more firmly in all parts of the world

I think we have only begun in pictures" he declares Whe recording is improved and we really get in stride the advanc will be remarkable"

(*Continued on Page 46*

PHOTOGRAPHIC CONTROL IN VARIABLE DENSITY RECORDING

A Paper Included in the Technical Digest of the Academy of Motion Picture Arts and Sciences

By WESLEY C. MILLER

Chief Transmission Engineer Metro Goldwyn Mayer Studios

SOUND reproduction presents three basic problems First the original sound must be picked up by some device—a microphone Later, sound must be re-created by a loud speaker or its equivalent in such a manner as to reach a listener as a good substitute for the original In between are all of the steps of amplification and recording involving various kinds of energy conversions The entire philosophy of the process is based upon the attempt to keep the results of each step strictly proportional to the original In cases where this is not entirely practicable correction may be made in one step for some unavoidable distortion introduced by another

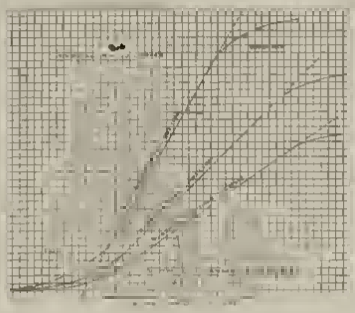


Fig 2

For the purpose of a photographic analysis of variable density recording and reproducing suppose we modify this fundamental division and use that shown in Fig 1 Up to the point of exposing the sound negative we can maintain good proportionality with the original sound Also from the time the sound positive produces electrical variations which later are converted to sound we can maintain similarly good proportionality But if the same condition fails to exist in the photographic part of the process our overall result suffers Let us then state the photographic problem thus—the transmission of a sound positive must be strictly proportional to the original negative exposure which it represents

Any technical process has certain limitations Recognition of them is an incentive to remove them or to decrease their effect In any case to determine them and to work within them is good engineering The author's intimate contact with heavy production using the light valve variable density method since the beginning of commercial work with it has led to certain conclusions in this respect It is the desire in this article to describe some features of the method and to present a means of analysis which has been found to be of great value in controlling results The latter is not original in principle It has however the distinct merit of affording a way of stating the problem simply and of readily determining how well practical success has been attained

The usual means of arriving at the conditions for proportionality in the photographic processes is by reference to the familiar Huerter & Driffield curves for the emulsion used such as those shown in Fig 2 plotted between density D, and the logarithm of the exposure E These curves exhibit the characteristic of having a curved toe in the region of under exposure a curved shoulder at over exposure and in between a section which approaches a straight line The slope of the straight portion determines gamma (γ), the contrast factor which up to a certain point increases with time of development. The intersection of the straight portion extended, with the log E axis determines the inertia i which is not of immediate interest

The straight part of the curve may be represented by the equation

$$D = \log \frac{1}{T} = \gamma \ (\log E - \log i)$$

where T the transmission is the ratio of transmitted light to incident light—through the film

This equation may be written

$$T = k\, E^{-\gamma}$$

This relation holds for both negative and positive that is

$$T_n = k_n\, E_n^{-\gamma_n}$$

$$T_p = k_p\, E_p^{-\gamma_p}$$

where the subscripts n and p apply to negative and positive respectively The various k factors are constants

In printing the positive exposure is proportional to the negative transmission hence

$$E_p = k' T_n$$

From these relations we may determine the overall relation

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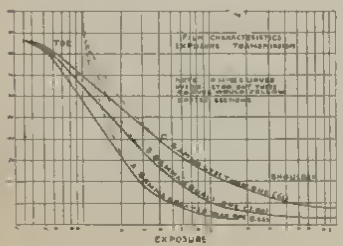


Fig 1

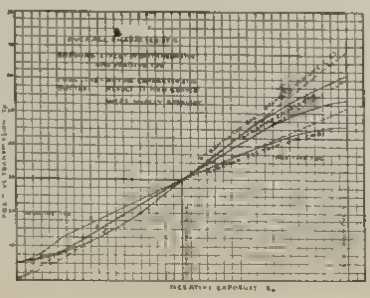


Fig 4

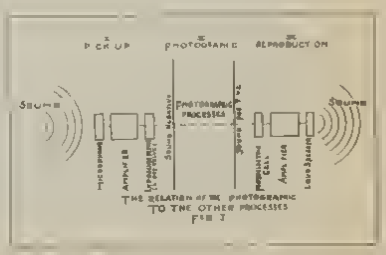
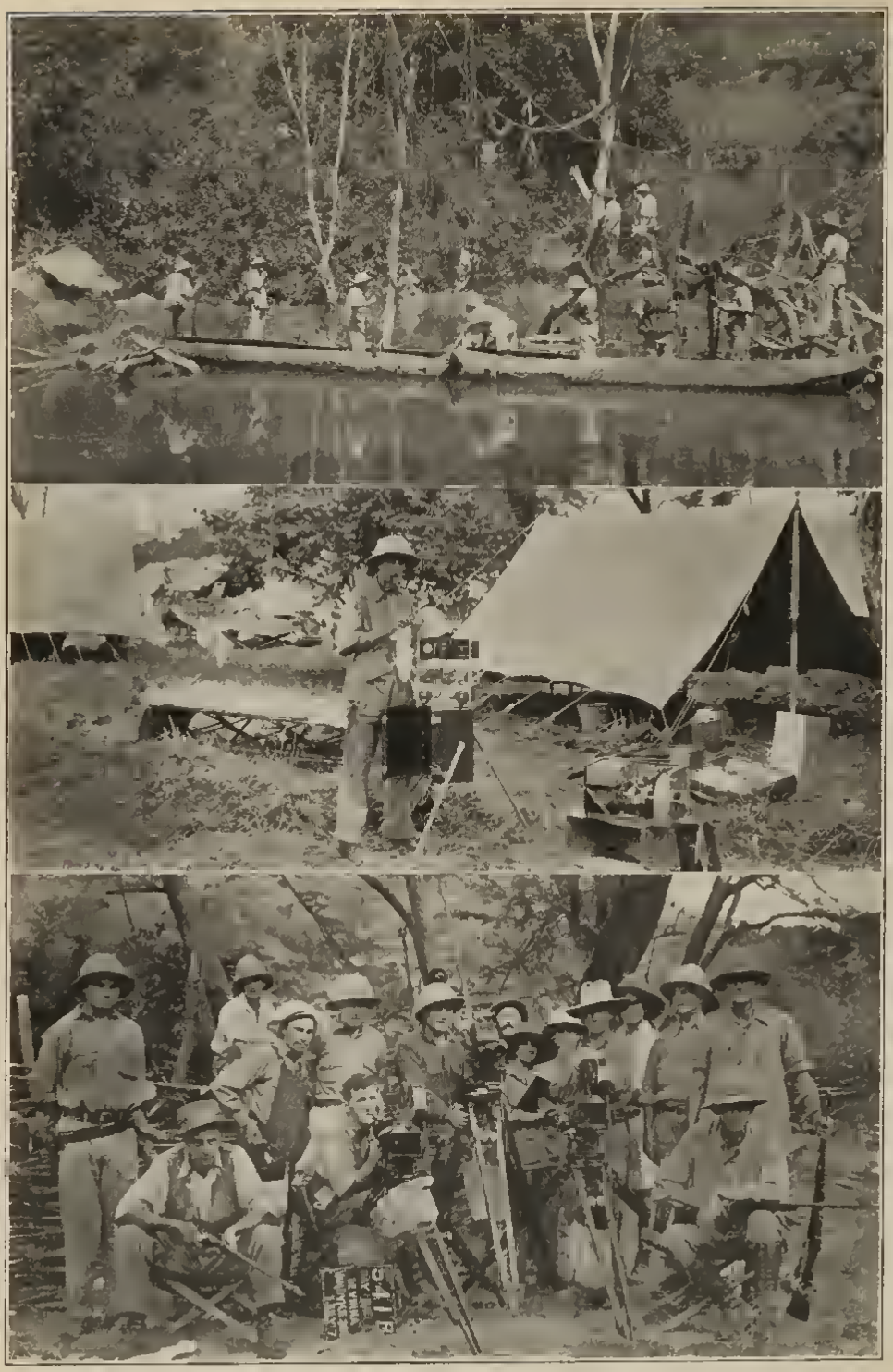


Fig 3



In Africa with "Trader Horn"

Top to bottom: Cameraman Clyde DeVinna, chief cinematographer with his assistant, William H. Sickner, and technical staff

IN AFRICA WITH TRADER HORN

Clyde De Vinna, A. S. C., Gives a Few Facts on Photographing in African Jungle

By WILLIAM STULL, A. S. C.

THE set designers in Hollywood's studios can, and have built sets representing almost every part of this world and the next, but when the officials of the Metro Goldwyn-Mayer Studios want their scenes made on the actual locations they always call for Clyde de Vinna, A S C Few men indeed have received such substantial evidences of executive confidence as Clyde has for he has been sent times without number, to remote corners of the earth far away from studio supervision at times entirely alone or even in charge of a company to bring back vitally important scenes for the studios big productions His success in this unique field is well attested by the scant time he has been allowed to remain in Hollywood during the past few years At times he has been fortunate enough to be able to photograph a picture or two in the studio before answering a hurry call to Kamchatka or Zanzibar, but of late even this has been denied him as he has been assigned the photographic direction of three successive specials filmed entirely on remote locations

The first of these three was the superbly beautiful epic White Shadows in the South Seas " which took Clyde and his directorial teammate, W S Van Dyke to Tahiti for many months The success of this picture was so complete that they were immediately rushed back to Polynesia to create Ramon Novarro's ' The Pagan " Now they have just returned from ten months in darkest Africa where they have battled hardship wild beasts and storms to make Trader Horn the outstanding production of 1930

That it most certainly will be that is the unqualified prediction of all who have seen the preliminary 'rushes' which have emerged from the crowded cutting rooms In point of size novelty and cost it easily takes place beside the most opulent epics of the silent screen While the exact amount of the production cost has not as yet been computed, it is known to exceed in cost all of the firm's previous pictures- with the single exception of the colossal Ben Hur " which it closely rivals. The magnitude of the undertaking can perhaps be imagined when it is learned that despite the most skillful management the bare operating cost of the company while in the field could not be brought below an average of $5 000 per day

Under these circumstances, the terrific responsibility resting on the shoulders of Director Van Dyke and First Cinematographer de Vinna is painful to imagine Their success is indicated however by the fact that the studio officials are unanimously enthusiastic over the picture, pronouncing it a worthy successor to the same team s White Shadows ' and well worth the costly 25 000 mile *safari* required

Concerning his own part in the expedition Mr deVinna is modestly reticent, though outspoken in his praise of the other members of the company We had a great trip he says and in spite of all the hardships and trouble we went through we ve managed to bring back a pretty good picture '

We left here," he continues February 4, 1929 and our advance party reached Mombasa on March 16 We went at once to Nairobi the principal city of the interior where we established our base And right there we got our first surprise for we found Nairobi in spite of its location in the wilds of Africa was a fine young city, and an ideal base By the time the rest of the party joined us a month later we had our laboratory installed and had put through it more than 14 000 feet of film that I had shot for tests etc During that month, we d gotten a couple of cars (all *safaris* are made by motor nowadays), and we'd been able to scout around that part of the country pretty well, and line up a lot of good locations

We d begun to get an idea of the tricky light conditions we were up against too You see most of our work was done on the plains, high above sea level where the air is so much thinner that although the sunlight beats down plenty hard from above there is little diffusion and the shadows are just so many big ink spots And down there by the equator we always had to knock off shooting between the hours of ten A M and three P M, because the angle of the sun made a nasty top-light which simply eliminated quality results and the shimmering heat-waves danced around so that anything but close ups were impossible Incidentally, it was usually so hot about that time that nobody could do any work, anyway

Still, by the time the rest of the bunch got down there we'd pretty well gotten used to these photographic conditions and were all ready to start work in earnest And work we did too! We *safari-ed* all over British East Africa up into the Uganda, and over into Belgian Congo making pictures all the while

Then all of a sudden when we were almost half through with the picture the studio cabled us that as the world was demanding its pictures all-talking, 'Trader Horn ' would have to talk too and so a sound crew was on its way to Africa to join us!

Well, the sound men reached us all right, and we found that they had brought everything with them but silenced cameras for us to use Then the fun began! We had to make talkies even though we didn t have the proper cameras—and believe it or not we did it! Our prop man was a wonderful fellow and he surprised us by breaking out a lot of felt and canvas and fixing up some surprisingly effective camera covers so with them and a few blankets our two standard Bell & Howells and George Nogle's Akeley did as good service as though they'd been the latest of sound cameras You can bet we were satisfied with them—until we got back to the studio and started bragging a bit about them Then we found that they'd sent us off two brand new *silent* Mitchells five or six months before' They re still trying to find those Mitchells!

'You can imagine we had to use a lot of such makeshifts out there in the bush for most of the time we were too far from even our Nairobi base to have anything to rely on but our own wits— and luck I recall one time when we were on *safari* from one camp to another Van and I were in the lead car several miles ahead of the others, when suddenly we came upon a lion with a fresh kill—a scene we specially needed We stopped the car and Van hurriedly sent back for the actors, while I got the cameras ready When all was ready to shoot we found that the reflectors were still back with the main party—a typical cameraman s bad break Well there was no time to send back for the things and we couldn t get on without them so we hurriedly threw some together We made two splendid hard ones out of a couple of five gallon gasoline—excuse me petrol—tins hammered out flat on wooden frames made from the crates they were shipped in and a couple of excellent 'soft ones (1916 style) out of the sheets on the leading lady's bed Pretty crude makeshifts I'll admit—but they worked and we got a scene that might have taken us weeks to get otherwise

' Another makeshift was our own African camera crane The script called for a scene showing our actors stumbling along in their headlong flight from the cannibals nearly dying of thirst in the waterless veldt, while the camera is raised straight up to reveal a water-hole directly ahead of them over a knoll Of course the scenarist meant well enough when he wrote it but after all—*he* didn't have to shoot it in the middle of Africa! That was our job!

When we came to make the scene we found the location easily enough but unfortunately Dr Fejos' famous camera crane was busy in Universal City California some six thousand miles away from where we very earnestly wanted it Again we put our heads together and finally evolved our primitive but effective substitute We set up an ordinary six-foot parallel, and from one side of it we ran a stout crossbar made of fresh cut timber to serve as the axis for our crane The crane itself was a twenty foot pole with a convenient fork at one end

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"50-50" . . . A SCENARIO WRITER HAS HOLLYWOOD LUCK

By HARRY LANG

THESE Hollywood jobs," grunted Mannie as he slammed the boss's door on his way *out*, ' are just fifty-fifty!—on the payroll one day, and on your Chinese jade fan the next . . ."

And then he barged down the hall from Michael V. Bladdich's fur-lined office, up two flights of stairs, through more halls and into the cubicle he shared with another ex-newspaperman who had also turned dialog-writer since Hollywood went audible.

"Bladdich," remarked Mannie as he slammed himself into his chair, "is a big fat stiff! He's a low-down, double-crossing bloodsucking—"

"Hey, wait!" yelled Cedric, his office-mate, "I've been fired myself, lots of times. I recognize the symptoms. Bladdich gave you the gate."

"Yeah, and he gave me a pain in the middle of the afternoon, too," amended Mannie. "Besides which, he's a misbegotten squid who hasn't got—"

"Aw, shut up!" bawled Cedric. "You've been here two months, haven't you? What did you expect when you came here—that this was going to be an old man's home? Two months is nearly a record of some kind. What did Bladdie say to you?"

"He sent me an office memo to see him at once," narrated Mannie. "I did. He said sit down. I did. He said 'Two mahnts ago, you kem here, hah?' I said 'yeah.' He said 'Who toldt you you was a dialok writer?' I said 'You told me yourself, Mr. Bladdich.' And he said 'So? Vell, now I tell you you aindt! You write dialok what sounds like a Y. M. C. A. hedwertize-ment! What we needt iss bep andt what you give us iss eppelsoss. I am sorry but we can't use you from now on. Goodt bye.'"

"And what did you say?" prompted Cedric as Mannie began to clean out his desk.

"Say?" yelled Mannie. "Say? He didn't gimme a chance to say anything. Listen, I don't mind gettin' fired by a regular guy, but you know, and everybody on this lot knows, and I know that Bladdich is a blankety-blank-blank . . ." And Mannie said a lot of things that newspapers would be arrested for sending through the mails.

"Why, tell *me*," Cedric finally managed to interpose. "Tell Bladdie."

"Yeah? How?" Mannie wanted to know. Then he got an idea. "All right, I will! ! !" he muttered, and stuck a sheet of paper in his typewriter and began a farewell letter to Michael V. Bladdich, who had just canned him.

He began it merely "Bladdich." The first paragraph, then started like this:

"You are a . . ."

It dealt largely with Bladdich's ancestry and family tree and was ripe in miraculous biological occurrences. A second paragraph detailed Mannie's views regarding Bladdich's level of intelligence, compared with which the lowness of a whale's abdomen was a huge elevation.

Then Mannie mentioned in detail the morals of Michael V. Bladdich. He referred with startling frankness to certain grand jury memoranda which had very mystifyingly disappeared from the official archives. He went into the matter of Bladdich's private personal habits to an extent that wasn't at all good taste. But then, Mannie wasn't trying to be in good taste, anyway. He was just telling Bladdich what he thought of him.

The letter, in short—although the letter itself wasn't short—was a masterpiece of something or other. It's a wonder—the typewriter didn't melt, and it was certain that the paper must have been an asbestos compound. If anybody in the postal service had ever opened the letter, seventeen postal inspectors would probably have been at Mannie's door the next morning, charging him with sending explosive, incendiary and various other kinds of matter through the mails. When Mannie had it finished he showed it to Cedric. Cedric blushed.

"What's the matter? Scald your sensibilities?" Mannie asked.

"No—just ashamed of my paltry vocabulary, after that," Cedric explained.

Mannie added a postscript:

"P. S.—And say, you (two lines of bad words), if you want to do anything about this you'll find me at the President Hotel."

Then he stuck it in an envelope, addressed it to Bladdich, stamped it, gathered his belongings, put on his hat and strode out. At the first mailbox he mailed it. Then he went to the *Journalists' Club* and got drunk for three days.

WHEN HE came out of it, he was on his back in bed. Some kind soul had put him there, Mannie didn't know who, but then Mannie had done the same for some of the other guys in days gone by, and one good turn deserves another.

"Hey, Smart! ! !" he yelled. He thumped on the floor. From downstairs somewhere came a response.

"Yassuh, Mist' Mannie, Uh huh—comin', suh." A minute later, and a black head atop a white coat appeared at Mannie's door.

"Smart," begged Mannie, "bring me a bromo and a paper and what time is it?"

"'Bout ten, suh?"

What night?"

Tuesday mawnin an' I'm bringin' de bromo an' de mawnin' papuh."

Smart vanished and Mannie realized he'd been non compos mentis since Saturday. He gulped the bromo and cussed it, as usual, for mostly going up his nose. He read the paper foggily until he saw the name of Michael V. Bladdich in large letters.

"FILM EXECUTIVE JAILED," the headlines announced. There were other heads about embezzlement and morals charges and things like that. There was a picture of Bladdich. And there was a story which Mannie managed to decipher.

(Continued on Page 30)



NEW FEARLESS SILENT CAMERA

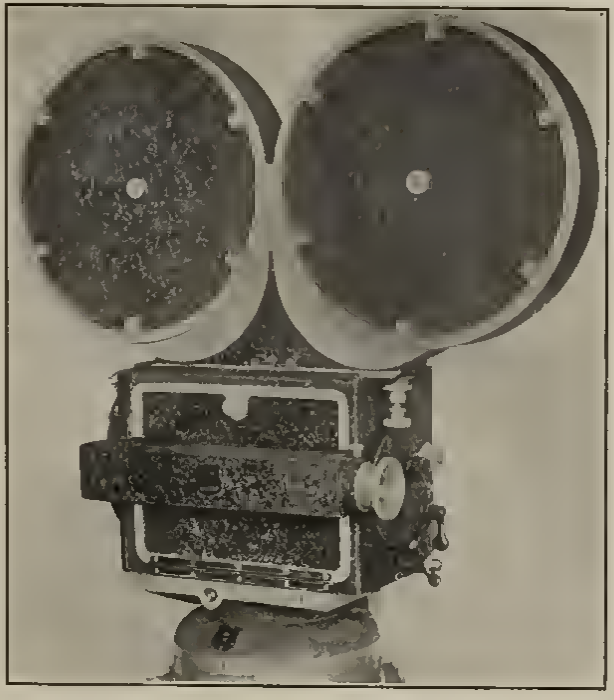
Ralph G. Fear Announces a New Professional Camera With Many Startling Features

RALPH G FEAR Head of the Fearless Camera Company, formerly the Cinema Equipment Co of Hollywood, an engineer well and favorably known in the Film Industry brings to a culmination years of study and endeavor in the presentation of the New Fearless Silent Camera Mr Fear has put into the New Fearless Silent Camera the accumulated scientific and practical knowledge gained through ten years of intimate association with the engineering phases of motion pictures

'Most of the professional motion picture cameras in common use today," says Mr Fear, "were designed a dozen or more years ago As a matter of fact there isn't a professional motion picture camera now in common use in the Studios that was not designed prior to 1920 These cameras were not designed for silence hence they all develop so much noise that with the advent of talking pictures it became necessary to provide some sort of sound proofing for the cameras in order that they might be used in sound productions This has resulted in a multitudinous array of booths, blimps. bungalows blankets etc in a vain effort to keep the camera noises within an enclosure so that they will not effect sound recording But even with these cumbersome devices and the attendant discomfort and trouble experienced with their use the noise still continues with sufficient volume to cause great trouble in recording

In addition the cameras present a bewildering appearance with their array of accessories that have become necessary with the advent of sound pictures

Some of the older camera manufacturers have tried with only partial success to silence their cameras They have replaced the conventional ball bearings which were of the old bicycle type and very noisy, with plain bearings Metalic gears have been replaced with Bakelite Movements have been quieted to some extent And one manufacturer covers his camera with sponge rubber None of these expedients has been entirely successful and we still find the cameras in booths, or the so-called blimps and bungalows'



The New Fearless Silent Camera

Continuing, Mr Fear says, I approached the problem of noisy cameras from a different angle than that followed by other engineers I contended that the scientific way to eliminate camera noise was at its source and with this thought in view invented and developed a silent camera movement which it is possible to run at high speed without noise This movement was first placed on the market in July 1928 It then became necessary to eliminate the balance of the noise in the cameras and after six months of intensive effort in re-designing and re-building, was successful in eliminating practically all the noise in the old cameras Dozens of these re-built cameras are in use today and no booth or sound-proofing is necessary with their use"

During the entire time that he was re-designing and re-building these old cameras, Mr Fear was perfecting a new camera designed for the present day conditions

'A modern motion picture camera" continues Mr Fear "should be so silent in operation that it can be used within ten feet of the microphones while photographing sound pictures Provision should be made within the camera for recording sound on the same film and at the same time that the image is being photographed It should be extremely easy to focus. retain all of the features in common use before the advent of sound and in addition should contain all of the modern accessories that have become necessary attachments with the permanent establishment of talking pictures It should fill the every need of modern motion picture photography. Such is the 1930 Model Fearless Silent Camera

"In addition to being so silent in its operation that the microphones may be placed within ten feet of the camera without picking up unwanted noises the Fearless Silent Camera embodies many new and desirable features However, it should be stated at this juncture that the Fearless Silent Camera does not contain any radical or untried features To the contrary, everything that goes into its construction is based on sound engineering principles

'The Fearless Silent Camera is equipped with the Fearless Simplex High-speed movement of which there are nearly half a hundred in use several having been installed in Europe This is the simplest camera movement in the world to thread and due to precision workmanship and accuracy of design is so silent while in motion that only by placing the ear against the frame of the movement can any sound be detected

'One of the outstanding factors that contribute to the almost uncanny silence of the Fearless Silent Camera," says Mr Fear, "is the full force oiling system that pumps oil under pressure to every bearing point This system of positive oiling is employed in all high grade automobiles, but this is the first time it has ever been applied to a motion picture camera. The few gears that are used in the Fearless Silent Camera are designed for silent operation and wherever ball bearings are necessary the finest of imported instrument bearings are used.

(Continued on Page 29)

As the Editor Sees It

Happy New Year!

AGAIN we are facing the dawn of a New Year Some of us face it with joyous eager anticipation, others with fear and trembling None of us know what the year will hold for us Of that we are certain

Strangely, many seem to feel that the first of January is different from the first of July or August or February Just another matter of habit or custom

However, as it is a time when most of the world makes good or bad, resolutions and slates are wiped clean for a new start why nor make a resolution that will affect our neighbors and fellow humans? Most of us resolve to do this or that or not to do this or that—always thinking solely of ourselves This year let's give the other fellow a thought

Wouldn t it be a wonderful thing if everybody resolved to do the best work possible each day, to treat others as we wish to be treated to be kind, cheerful ambitious, helpful merciful. charitable! Just imagine what such a resolution would mean—if it were made and kept' Most of us forget the other fellow in the mad scramble of life We step on him when he is down think only of self Let s change this year

And now that we have had our little say we wish you all a happy and prosperous New Year!

Glen Kershner

THE other morning we had a 7 o'clock breakfast appointment with Glen Kershner the genial gentleman whose present series of excellent drawings for this publication is attracting attention fir and near Now there is usually nothing very unusual about a breakfast appointment with a cartoonist But Kershner is not the usual type of cartoonist so there is the point that makes this writer burst forth with this pseudo literary effort

Arriving in front of Henry s famous restaurant the writer thought for a moment that a nomadic gypsy must have stopped there for breakfast for a car was parked by the curb and in it were the following one bass violin one artist s easel one set of golf clubs one motion picture camera one flute a box of oil paints and a drawing board The drawing board was perched on the knees of Kershner who was busily putting the finishing touches on the cartoon that appears on the opposite page of this magazine

This man Kershner was on the way to First National Studios where he was photographing a picture But he had the bass fiddle with him because he was going to play with some Symphony orchestra in Los Angeles that night He hoped he could finish work at the studio in time to do nine holes of golf. and in case anything happened so he would have more spare time he had his paints along to finish a picture he had started Meanwhile he was doing the cartoon while waiting for breakfast

The peculiar thing about Kershner is that he does everything well And he plays the piano—oh well here s the point! Next month's issue of this magazine will contain a feature story about Kershner, done by this writer himself—and if Glen doesn't give us a drawing showing how he looks to himself we'll put broken glass in his bass fiddle

Excuse Us, Please

NOW and then an error will creep into any publication We are particularly pleased over the absence of them in this publication However, they happen But we will say that we make a real one when it does take place

So we wish to beg the pardon of T E Finegan head of the Eastman Teaching Films Inc In the November issue we mention H T Cowling of the Eastman Teaching Films as head of the organization Mr Cowling wrote us about it, but his letter came too late to stop the second error in the December issue when we announced the addition of Mr Cowling to the editorial staff of the magazine and again called him head of Eastman Teaching Films Now we wish to say that it is Dr Finegan who is head of this organization and in our next issue we will have a story about his work that should be of interest to all our readers the Editor

The Hollywood Mind

AND now another 'author-critic rises to say a few ungentlemanly things about the motion picture people of Hollywood This time it is Benjamin De Casseres and his pen or pencil or typewriter must have scorched as he wrote his thoughts

Mr De Casseres in part says There is something Silurian and pre Devonian in the set, deeply incrusted and unmalleable quality of the motion picture mind When movement does take place the causes must be sought for externally in some great catastrophy in the box office It has no internal principle of movement such as governs the minds of humans living elsewhere It is for this reason that the Hollywood mind is precisely today what it was in 1914 It cannot change What seems so is mechanical movement caused by a series of external shocks Oh what a piece of work is this Hollywood mind! How ant-like in reason! How infinite pre-established vacuity! In action how like a jazz band! In apprehension how like a blotter! The Publicity Beauty of the world! The paragon of the tabloid bean! And all its learning might be bounded in a peanut shell!"

Well well And then three bad eggs, for they would not create an odor quite so distasteful as Mr Casseres' remarks

Really, it is a peculiar thing how critics and authors strike out at Hollywood and its people with all the vitriolic power they possess And then, isn't it funny to watch the critics and authors grab onto the fountain pen and sign their names to the contracts when these feeble minded persons of Hollywood sometimes offer them a piece of change for an idea! And then oh, so often it turns out that the critic or author has no ideas The whistle toots and the bell rings on the Santa Fe Chief and another author or critic is headed Eastward again while one of the ant like Hollywood minds tries to salvage a little something from the garble of words that said traveler's typewriter has turned out

It does seem peculiar how America leads the motion picture world how such pictures as 'Seventh Heaven" "Four Sons" The Big Parade" and a lot of others ever came to the screen, with ant-like minds behind them. However, scientists tell us that an ant is the strongest creature in the world comparatively —so perhaps Hollywood will manage to struggle along

Westerns Again

NO LESS a person than Jesse L Lasky asserts that the old time western picture will be brought back to the screen by the advent of the talkies Three cheers for Mr Lasky!

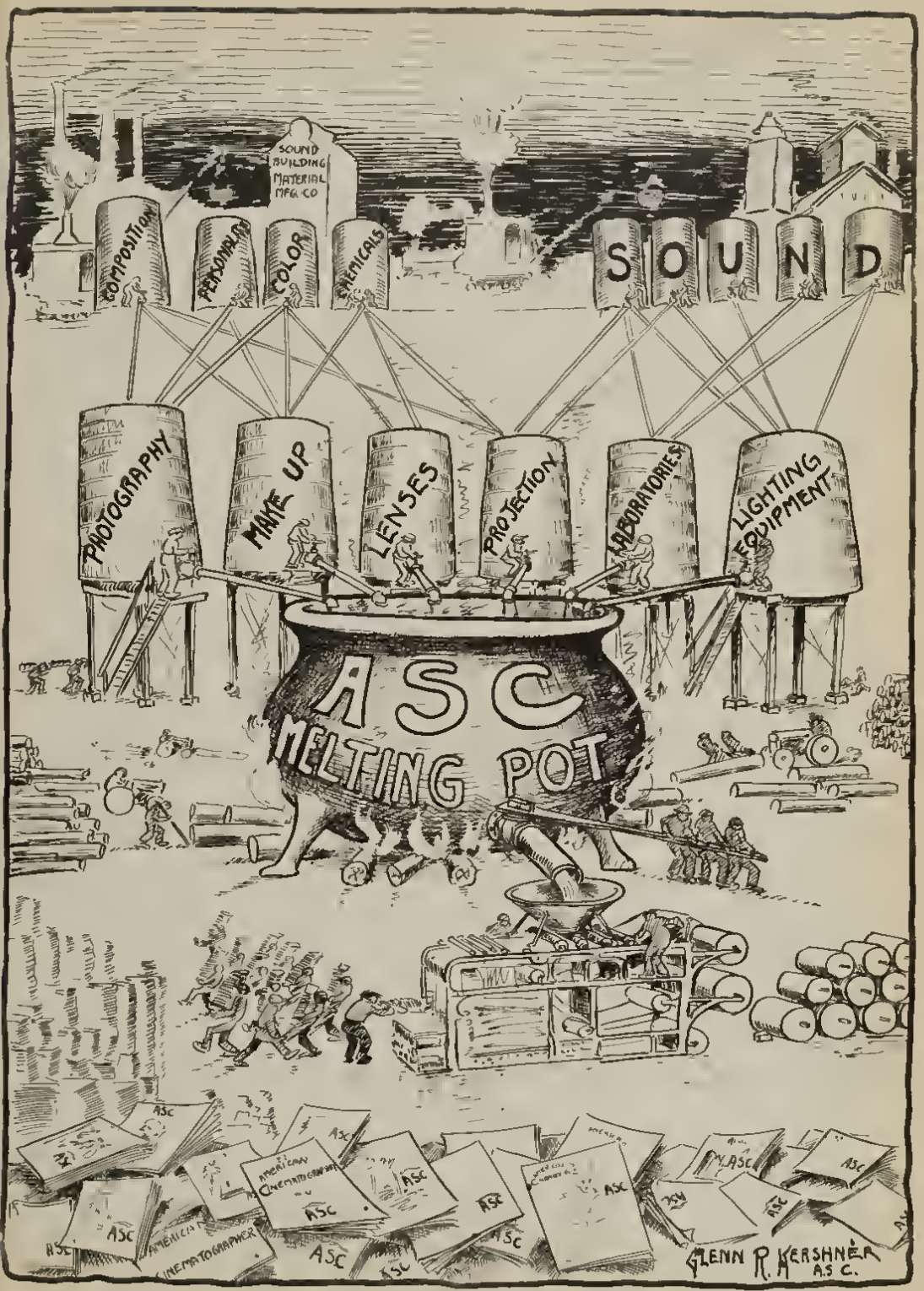
Somehow or other there never was a picture that sent men away from the theatre with blood tingling quite as did the westerns Every man is still a boy at heart. and don't you remember the thrills you used to get from reading the old nickel novels of adventure on the plains! Sure you do!

And now, according to Mr Lasky, the westerns will be better than before because they will have better constructed stories That is also good news More power to the producers who give us the hard riding heroes of the days that used to be

California

HIGH HO As we were coming to the office this morning it was so warm we had to use a lot of will power to keep from doffing the coat and walking in our shirt sleeves And then we picked up the paper and saw where even the racketeers in Chicago had been snowed under and beautiful white drifts of snow were some places fourteen feet deep We threw open the windows gave some fresh water to the roses we had picked in our back yard and decided that we could kiss the man who gave us the yen for California and would not be effeminate either

And then Don Thomas of the All-Year Club of Southern California sent us word that 697.420 tourists (count them yourself) had visited California in the first eleven months of 1929 We don't blame them! There should have been a million and all should be here for Christmas and see Hollywood Boulevard lighted up with decorated Christmas trees Top coats still in the moth balls. sun-tanned youngsters laughingly prancing along the street waiting for the real reindeers that nightly drew Santa—and a beautiful movie star—down the street We are not boasting—we are just saying we are lucky to be here


SOUND BUILDING MATERIAL MFG CO
COMPOSITION
PERSONALITY
COLOR
CHEMICALS
SOUND
PHOTOGRAPHY
MAKE UP
LENSES
PROJECTION
LABORATORIES
LIGHTING EQUIPMENT
ASC
MELTING POT
ASC
AMERICAN CINEMATOGRAPHER
GLENN R. KERSHNER A.S.C.

1930 AND THE A. S. C.

By John F. Seitz

President of The American Society of Cinematographers

AS PRESIDENT of the American Society of Cinematographers, I take this opportunity of wishing a happy and prosperous New Year to every member of this organization; to the readers and supporters of our magazine, *The American Cinematographer*, and to our countless friends scattered throughout the world.

The year 1929 has been an eventful one in the motion picture industry. Changes have taken place and developments have been so rapid that it almost takes one's breath away to try to realize all that has happened. It has been a prosperous year as well, and the industry should be proud of the 1929 achievements.

The society has prospered to an almost unbelieveable extent, and has enjoyed one of the most eventful and outstanding years of its history. Today, as we face the new year, the society stands in an enviable position. Never before has the society been so strongly entrenched. Never before has its future been so promising.

Our magazine, *The American Cinematographer*, has completed the most successful year of its history and today stands preeminent in its field as the outstanding publication of its kind—a magazine that is awaited eagerly by readers all over the United States and in thirty-six foreign countries. During the past year it has expanded and developed even beyond expectations; and 1930 gives promise of further advancement that will be startling.

The society is now preparing a technical book to be called the Cinematographic Annual. The publishing of this book, I believe, will be one of the biggest contributions of the society for 1930, because it will be a publication that will fill a long felt want. In it we will have information that can be found nowhere else, and prepared by outstanding authorities. I hope and expect this book will be the last word in technical works of its kind and will bring out still more emphatically the efforts of this society to further the interests of cinetography and allied fields of the motion picture industry.

During the coming year the society plans much in an educational way for its members which will have an excellent effect upon the industry. Courses in mathematics, physics and other subjects are being planned, and the society will be well in the van of educational peogress.

Throughout the years of the society's existence this organization has always had the advancement of cinematography and cinematographers as one of its chief aims. A glance through the records of the past reveals much in the way of accomplishment. It is the aim now to make the service of the society still more valuable to every member and to the industry, to keep alive and shining our slogan "Loyalty, Progress, Art."

International Institute to Publicize New Films

THE INTERNATIONAL EDUCATIONAL CINEMATOGRAPHIC INSTITUTE organ of the League of Nations is planning to make a regular survey of what has been achieved by the various Nations with regard to the production of educational, scholastic, documentary or purely recreative films

To this end it appeals to all producers and editors of such films, begging them to communicate to the International Institute their own programme of production

To encourage the creation of such films and make known what is being done in that line the Institute will dedicate some pages of the International Review of Educational Cinematography to the advertisement of the films which are being prepared publishing also photographs to illustrate their educational scientific scholastic or documentary or technical character. The Review is a monthly publication edited by the Institute It appears in English, French, German, Italian and Spanish Thousands of copies are being circulated and it is read by 52 various nations

In this way, a general propaganda for educational films is being organized by the Institute which offers in an entirely disinterested way to help the producers of every country An international Catalogue will eventually be published by the Institute of all films which are deemed to possess a real educational value and will be circulated in every country

All kinds of information possible accompanied by the list of titles and by photographs must be sent to the International Educational Cinematographic Institute Villa Torlonia, Via Lazzaeo Spallanzani 1 (Documentation Office) ROME

E. R. P. I. Analyzes 75 Theatres Weekly

TO INCREASE the acoustic quality of Western Electric wired houses, seventy-five theatres are now being acoustically analyzed every week by the acoustic department of Electrical Research Products under the supervision of S K Wolf In every case where the analysis shows that the theatre is in need of acoustic treatment, a specific acoustic recommendation is made for the treatment of the theatre

The long period of development work carried on by the acoustic department has enabled the company to make these analyses and recommendations on a strict engineering basis The work divides itself in two parts First a complete acoustic survey is made in the theatre by the company's engineers Written reports of this survey are sent to the acoustic engineers in the home office who analyze these reports to determine the acoustic values of the house, and to draw up recommendations for treatment when needed

In making the surveys engineers are required to determine the exact volume and seating capacity, nature and thickness of all surfaces in the theatre type, thickness and amount of draping and decorating material used in theatre, exact nature of all seats and furniture, etc It also includes a noise survey and recommendations for eliminating all noises in the house So complete is this survey, the report covers five pages, and either accurate sketches or architects' drawings must be included in the survey reports

Pahle at Pathe

Ted Pahle, A S C, has left Paramount New York studios and is now in charge of the camera department of Pathe's New York studio

"ALL QUIET *on the* WESTERN FRONT"

. . . Universal Pictures

Out into the Night —
The Cheering —
[from the Projection Room]

PERFECT PHOTOGRAPHY
ARTHUR EDESON, A. S. C.

EASTMAN
Panchromatic Negative
[TYPE TWO]

J. E. Brulatour, Inc.
New York Chicago Hollywood

"HELL'S ANGELS" COMPLETED



Camera Staff on "Hell's Angels"

Left to right: Ross [illegible], [illegible] Contrucci, Tony Gaudio, A. S. C. Chief Cinematographer, Jockey Fockel, D[illegible] Boreman, Harry Perry, A. S. C. [illegible] assistant photography, Rod Tolmie, Lester Short, Fred Eldridge, Jim Davis, Sam Landers.

HELL'S ANGELS heralded as the "most lavish screen enterprise of all time" will make its world debut on Broadway at the George M. Cohan theatre, in March. The Western premiere will follow shortly thereafter, and subsequently the film will be road showed throughout the country.

The multi-million-dollar air thriller produced and personally directed by Howard Hughes, president of the Caddo Company, is finally and actually nearing completion after approximately three years in the making. This information comes from the Caddo office direct.

The last shot, a battle scene in which exactly 1700 ex-soldiers participated, was filmed on December 7, and the picture is now being cut and edited for public showing.

Hell's Angels" promises to be one of the 1930 sensations of the film industry. It will be 100 per cent sound and talking, will have a technicolor sequence, and is packed with air thrills.

Actual filming of Hell's Angels began on October 31, 1927, following six months of preliminary research and preparation. Shooting has proceeded steadily with 18 months alone devoted to the aviation and zeppelin sequences. Delays, occasioned by unfavorable weather for aerial photography, have prolonged the production.

Also, the decision of Producer-Director Hughes several months ago to re-film the silent version, converting his picture into an all-talking presentation, has delayed its completion. Hell's Angels," originally began as a silent picture before the advent of 'talkies.' All of the non-flying sequences were re-shot with conversation and sound.

Ben Lyon and James Hall, principal players in this stupendous drama of air-war, are supported in the feminine department by Jean Harlow, a comparatively unknown actress who appears in her first screen role in Hell's Angels. Miss Harlow, a former Chicago society beauty, replaces Greta Nissen, the Norwegian star who appeared in the silent version. She is a natural blonde of striking beauty, and is being groomed by the Caddo Company for stellar roles in the future. Others who appear in the roster of players include John Darrow, Lucien Prival, Jane Winton, Douglas Gilmore, Stephen Carr.

(Continued on Page 30)



The last scene photographed in Howard Hughes picture, Hell's Angels.



Through this doorway come ideas which vitalize an industry

It is a simple stone doorway, of becoming dignity and architectural grace. With its doors but newly hung, the building to which it gives access already hums with the activity of research and experiment into the complexities of modern motion picture technique . . . thus the Bell & Howell Engineering Development Department dedicates its new home— with work.

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Photographic Control In Variable Density Recording

(*Continued from Page 7*)

between negative exposure and resulting positive transmission

$$T_p = K E_n^{\gamma_n \gamma_p}$$

If the exponent $(\gamma_n \gamma_p)$, that is the product of negative and positive gamma is made equal to one we have the required condition of proportionality between negative exposure and positive transmission Excepting certain adjustments which must be made for the effects of parts of the apparatus *this is the relation upon which the entire success of this method of variable density recording depends* Suppose we analyze it

First let us convert equation (1) inro the form of equation (2) and plot the results—that is

$$T = k E^{-\gamma}$$

We find that the curves of Fig 2 plotted in this manner in Fig 3 are of entirely different character Unfortunately this is the form which must interest us in recording In this figure the full lines show the counterparts of the curves in Fig 2, the dotted lines representing the results which would be obtained if the H & D curve were entirely straight—a practical impossibility The same kind of curves of course, obtain for both negative and positive We learn three important things from these curves

1 The record obtained from a negative is far from proportional to the original
2 It is necessary to counteract this distortion in making and processing the positive In other words we must combine two exponential curves to produce the overall relation of proportionality—a straight line
3 The toe and shoulder sections of the H & D curves show up in Fig 3 as the departures from the dotted sections The toe is of great interest as will be seen later

It is a requirement—expressed in terms of the H & D curve —that we control exposures so as to remain on the straight section if our overall proportionality is to be correct. We must similarly remain off of the toe and shoulder sections of the exposure transmission curves To keep away from the shoulder generally involves no hardship—merely the adjustment of maximum exposure to remain below the over-exposure point an adjustment which still leaves plenty of latitude of exposure On the other hand we often wish to go to zero exposure to utilize the full range of the light valve, but to do this we get down on the toe section and distortion results

Suppose we take the curves of Fig 3 selecting one for the negative having a gamma less than one, and for the positive a gamma greater than one—a practical combination—and combine them graphically or mathematically to simulate the printing process We find the result in Fig 4, plotted between original negative exposure E_n and resulting positive transmission T_p For the moment consider only the central portions of the curves and the dotted extensions If the product of our gammas—that is the overall gamma—equals one we have (b), which is a straight line throughout If the overall gamma is greater than one we have (a) and if less, we have (c) Either (a) or (c) would obviously produce distortion

These curves are constructed so that on neither negative nor positive is the shoulder portion used a practical condition The dotted sections show what would happen if the toe sections did not exist The complete full line curves show the actual curves resulting from a commercial emulsion the departure from the theoretical being caused by the negative toe at low exposures and by the positive toe at high exposures

This figure which is the practical result of equation (6), shows us then that

1 The overall gamma is quite critical
2 Both negative and positive toe sections are detrimental to quality
3 We must keep the toes as small as possible
4 We must limit the negative exposure to the regions inside the two toe sections if we wish to minimize distortion

Another point of interest, not shown by this particular figure but arising from it is that decreasing the slope of these curves that is decreasing positive transmission for a given negative exposure scale decreases somewhat the detrimental effect of the positive toe

In practice the negative exposure is fixed by the scale of the emulsion and to some extent by the recording lamp available The positive transmission range is fixed by the requirements of the reproducing apparatus In Fig 5 is shown the result of actual measurements of this overall relation for production work under average good conditions Better results have been obtained —also worse It will be seen that over the central part of the range of negative exposures, good proportionality of positive transmission is obtained As we use more of the exposure range we begin to strike the curved section at each end This occurs on the average from 50 to 60 per cent modulation when using Eastman positive stock with normal development formulae—or about perhaps 6 db below the clasb point of the light valve—zero exposure Reaching these curved sections clearly produces a distortion the seriousness of which depends upon the type of sound and the quality requirements of the producer For ease in estimating this distortion a sine wave exposure is shown—for low modulation and for complete modulation—with the resulting transmission variation the loss in quality due to recording at high modulation of the valve being shown by the shaded portions

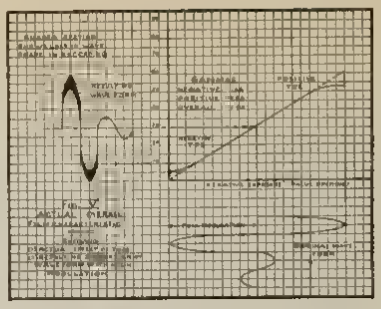


Fig 5

This method of expression of the photographic relations shows clearly the inherent photographic mechanism of the light value variable density method of recording By it, starting with a quantity in the form of an electrical current which can be analyzed we see directly what the resulting electrical quantity will be and what departures from the original have been introduced in the photographic processes It proves the accuracy of gamma measurements, checks the chemical balance and condition of developer—both negative and positive—as these help to control the size and shape of the disturbing toes, shows us the modulation limits inside of which we must stay for relatively small introduction of spurious harmonics and consequent distortion In short, it gives an immediate overall picture of what is happening In practice it has been found to be an excellent means of checking and analyzing daily results under production conditions involving monthly some millions of fret of sound film records including both rushes and release prints

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Foreign countries in which one or more Western Electric Sound Systems have been installed include. Great Britain, Canada, Australia, Belgium, Czechoslovakia, Denmark Egypt, Finland France, Hungary, Italy, Netherlands, Norway, Poland, Spain Sweden, Switzerland, Turkey, the Balkan States, Australia, China India Japan New Zealand the Philippines, Argentina, Brazil

An example of the extent to which talking pictures are encircling the earth is found in the installation of the Western Electric Sound System at Verldensteatret Trondhjem, Norway, only 190 miles away from the Arctic Circle

Edeson Shooting Universal Feature

ARTHUR EDESON, A S C, one of Hollywood's foremost cinematographers, is director of photography on Universal's gigantic super-production of 'All Quiet On the Western Front, Erich Maria Remarque s sensational book of the war

Edeson has charge of the corps of cameramen who are being used on the spectacular Western Front scenes of the picture Among the pictures he has photographed are "The Cock-eyed World" Robinhood ' 'The Patent Leather Kid' and 'The Drop Kick'



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National Photographic Carbons

White Flame and Panchromatic

Oscar B. Depue Designs New Combination Printer

By D. J. Goff

AS CHICAGO field representative of the *American Cinematographer*, I recently had the pleasure of interviewing Oscar B Depue whose achievements in the design and manufacture of cinematographic laboratory apparatus are familiar to everyone in the industry Mr Depue has just completed an entirely new combination printer which will do even more than the most exacting director could wish for

The new printer is in reality three machines in one for it is not only an unsurpassed optical printer, but also a marvellously capable trick-camera and an excellent continuous printer The machine itself is a marvel of design and workmanship made with all the scrupulous attention to detail for which the Depue printers have always been famous In designing the printer Mr Depue has so arranged the gate that in addition to regular contact printing, it will take a curved aperture-plate for printing master positives and duplicate negatives The Wratten filters are mounted in such a way as to permit quick insertion or removal, and in a position where heating is avoided As they are midway between the light source and the negative specks of dust on them will not throw shadows on the film As there is space provided for camera masks the size and shape of the aperture can be varied at will—a valuable aid in printing sound on-film scenes It will also eliminate the sound track by slightly enlarging the picture, or leave a space for one without injuring the composition by slightly reducing

Another important point which Mr Depue has covered in the design of his printer is the aperture-plate The pressure plate is recessed a few thousandths of an inch and blackened so that the surface will not reflect the light through the positive film Of course this practice has long been followed in camera construction but this is believed to be the first printer to do so up to the present time all continuous printers have been made with a highly polished steel pressure-plate which naturally reflects a certain amount of light, softening down the print undesirably This effect is probably the reason why many experts have preferred the step printer which having no polished reflecting surface tends to give a snappier print Mr Depue's attention to this minute and hitherto unnoticed detail bids fair to put continuous printers on a par with step printers in this respect Incidentally, as he uses the same device for printing the sound track the audible quality is equally improved

The machine is of course fitted with Mr Depue's famous automatic light control which has a capacity of 152 scenes and 18 different densities which automatically takes care of the usual 1000 ft roll of negative and is invaluable where machine developing is used The machine is also so arranged that the operator can sit facing the machine instead of at one end of it This adds greatly to the general convenience of its operation

The lamp house is attached by sliding on two bars that are furnished for the 16mm optical printing head and it is but a moment's work to remove it and fit any of the various attachments furnished for the main printer The machine is capable of handling every printing operation conceivable with either 16mm or 35mm film or both Aside from being able to enlarge or reduce and print from 35mm stock to sub-standard or vice-versa it will print reverse motion stop motion fades, lap-dissolves multiple exposures etc, and all manner of unique and difficult trick scenes such as making close-ups out of long-shots and the like Truly it is a most marvellously versatile machine which will find a warm welcome in any laboratory

Mr Depue is now working on a printer for the simultaneous printing of sound and picture negatives This latest device is already more than half completed, and embodies many original and ingenious features which I feel sure will make the machine so invaluable that the industry will be quick to adopt it As soon as it is completed I have been promised an opportunity to inspect it after which the readers of the *American Cinematographer* will be able again to have information of the latest product of that unsurpassed genius, Oscar Depue

Len Roos No Longer With Cinema Equipment Company

Len Roos A. S. C. who for a time was with the Cinema Equipment Company is no longer associated with that concern

Storing and Handling Film And Attending Hazards

This article from the Department of Commerce at Washington should be read by every one who handles film in any capacity Ed

NOTWITHSTANDING the severe lesson taught by the Cleveland Clinic disaster of May 15 1929 and the widespread publicity then given to the hazard involved in the handling and storage of nitrocellulose films serious accidents attributable to such films occur states Dr Charles E Munroe Chief Explosives Chemist of the United States Bureau of Mines Department of Commerce Only recently accidents of this nature occurred at Los Angeles San Francisco Salt Lake City, Newark, N J, and at Opelousas, La, resulting in many casualties some of which were fatal and in heavy property damage Stored nitrocellulose films such as are used in the production of moving pictures and X-ray photographs present the menace of fire, explosion and wholesale gaseous poisoning Dr Munroe warns For these reasons such films should be stored only in accordance with the best practice

Flameless combustion of nitrocellulose films can be started by exposure to temperatures as low as 150°C The danger of spontaneous decomposition of film eventually resulting in spontaneous combustion and their capacity to acquire static charges through friction are also referred to by Dr Munroe

The first accident of any magnitude caused by nitrocellulose films, appears to be that which occurred in the Ferguson building Pittsburgh Pa on September 27 1909 whereby a modern office building was seriously damaged and 50 persons were injured This event was thoroughly inquired into by explosives experts from the Pittsburgh Testing Station of the Bureau of Mines who also made an exhaustive experimental study of moving picture films such as were involved in the disaster The report was published in the Nickelodeon one of the pioneer moving picture journals and was reprinted by the Board of Underwriters of Allegheny County Pa, for the information of the fire insurance fraternity

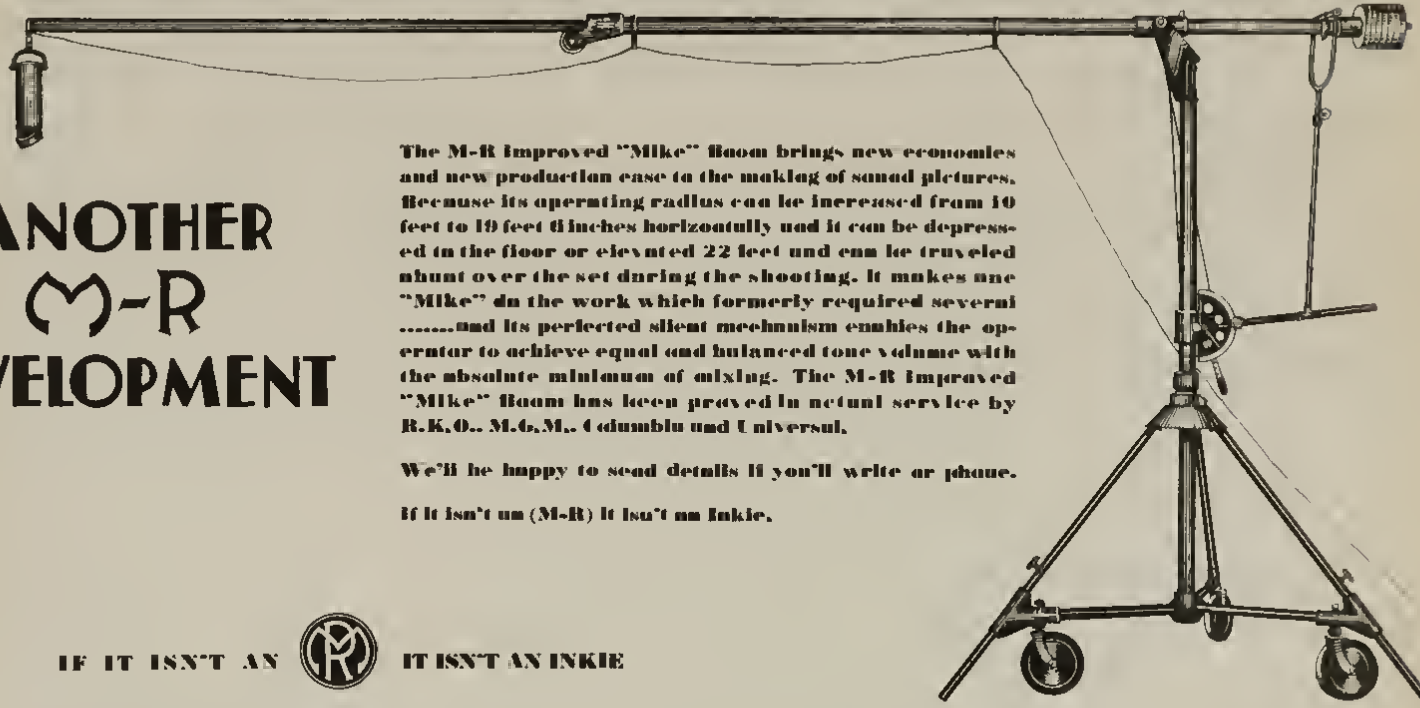
That moving picture films were like thin strips or shavings of other combustible substances easily ignited quite inflammable and highly combustible was quite generally known and because of their being composed of cellulose nitrates many recognized the possibility of explosions resident in them A characteristic of the films that was then little known but which was emphasized in the Bureau of Mines report was that nitrocellulose films could undergo flameless combustion a process of decomposition which may be started at a relatively low temperature and which proceeds autocatalytically after it is once initiated As a fact film was carefully observed in the dark while this flameless combustion was actively going on in the film and no flame nor even a glow of light was seen though heat was set free This process of decomposition also gives rise to the evolution of very considerable quantities of nitrous fumes and of carbon monoxide, and each of these substances is extremely poisonous and, as mixed, very dangerous to encounter Furthermore, since carbon monoxide is quite combustible and the nitrous fumes are supporters of combustion, violently explosive gaseous mixtures may be formed from them alone or in admixture with air.

As flameless combustion of nitrocellulose films can be started by exposure to temperatures as low as 150° C, brief contact with the bulb of a glowing incandescent electric lamp a heated steam coil, the glowing end of a cigarette, a hot wire, a flame or similar sources of heat will almost immediately start this reaction, and it may even be started through more prolonged contact with bodies heated to but 100°C the temperature of boiling water When flameless combustion is initiated in a mass of films it may, according to circumstances, continue throughout the mass, or it may be transformed to active combustion which is accompanied by the production of flame and the evolution of light as well as heat This transformation is the more likely to occur if the mass of films is insulated so that the heat generated in flameless combustion accumulates in the mass

(Continued on Page 40)

London—Vocafilms is a new company established with studios at Darwen The firm plans to produce at least six feature productions and 52 shorts during the coming year

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Principles and Processes of Photography in Natural Colors

(*Continued from Page 4*)

unable to realize much commercial success from any one of these methods

Of the many references published on color photography, Wall s *History of Three Color Photography*, which was published in 1925, is perhaps the most valuable since it represents a compendium of information of all phases of the subject

Classification of Processes of Color Photography

It is convenient to divide processes of color pbotography into two classes, the *additive* and *subtractive* methods. In the former a colored result is produced by starting with a dark screen (one on which no light is falling) and adding components of white light until the desired color is obtained An example of this method is Maxwell's experiment In the subtractive process it can be considered that a white screen is used and that certain parts of white light are subtracted or taken away until the desired color is obtained

The triangular diagram in Fig 6 illustrates the principles of the subtractive process As noted in the figure, when a strip of magenta gelatin which will absorb green ight is placed over a strip of blue-green gelatin which absorbs red light only blue light is transmitted Thus a blue image may be obtained either by projecting through a blue filter or through a combination of magenta and blue green filters Similarly a red image may be obtained by putting a yellow one on top of a magenta image or a green image by putting a blue green image on top of a yellow image The art of painting makes use of a subtractive process since it consists in applying colored pigments to a canvas until the resulting combination gives the desired result

For purposes of presentation the subject has been classified as follows

I *Still Photography*
- A Transparencies
 - 1 Additive Processes
 - (a) Three color
 - (b) Two color
 - 2 Subtractive Processes
 - (a) Three color
 - (b) Two color
- B Prints
 - 1 Additive Processes
 - 2 Subtractive Processes
 - (a) Three color
 - (b) Two color

II *Motion Picture Photography*
- A Transparencies
 - 1 Additive Processes
 - (a) Three color
 - (b) Two color
 - 2. Subtractive Processes
 - (a) Three color
 - (b) Two color
- B Prints

I STILL PHOTOGRAPHY

A Color Transparencies

1 Additive Processes

(a) Three-color Triple Exposure Methods One of the earlier methods which received some commercial recognition was the three-color additive process of Professor Miethe of Berlin His camera had a repeating back or means of successively exposing the three-color separation negatives through the requisite filter placed in front of the plates The positive plates printed from these negatives were projected by means of a complicated triple lantern. This process, however and a similar one designed by F E Ives, another pioneer in color photography, had the objection that the pictures were not taken simultaneously and required an intricate lantern for projection To overcome these difficulties Ives designed a camera wherein two special mirrors split up the light entering the single lens and exposed the three plates simultaneously By a similar principle the three-color impressions could be examined in a special viewing outfit Ives also designed a method for making stereoscopic pairs of three color positives (Kromograms) which were viewed in a device called the "Kromscop". (See Figs 7 and 8) Cameras for making three-color negatives have also been designed by Butler White Sanger-Sbepherd and others

Screen Plate Processes One of the novel processes suggested by Du Hauron was that the surface of a plate might be covered with tiny filters, red, green and blue, and then the sensitive emulsion coated on top By photographing through the back of the plate an image would be obtained which was cut up into tiny sections similar in size and shape to the filter sections Several systems of making these 'screen" plates have been worked out The methods may be divided into two groups according as they yield (a) a regular pattern or (b) an irregular pattern Examples of the former would be methods of ruling a series of red, green, and blue lines on the plate surface or producing a mosaic of tiny red blue and green squares The latter or irregular method is represented by processes whereby colored particles one layer thick are dusted on the plate surface

In 1892 the first recorded attempt to make a screen plate of the regular type was made by J. Joly of Dublin He obtained rather pleasing results by ruled line methods His line screen was on a separate plate and after the negative had been exposed, a positive was printed and placed carefully in register behind another line screen About the same time, J W McDonough of Chicago Ill introduced a process somewhat analogous to Joly s method Fig 9 is a reproduction of a slide made by the McDonough process

The most successful commercial process however is the Autochrome which was introduced by A and L Lumiere in France in 1907 This is an irregular screen process wherein minute grains of potato starch varied in form and size are dyed in separate batches blue green and red with dyes especially selected for that purpose The dyed grains are mixed in the ration of four green to three red to two blue and are dusted on the surface of the plate The interstices are filled with a black powder and the layer rolled in under pressure The plate is then varnished and coated with a panchromatic emulsion When finished there are over four million of these color filters per square inch (see Fig 10) Although the three colors should combine to give the effect of white when looking through the screen, they actually appear a salmon pink Exposure is made through the glass side so the light will have to pass through the colored screen before reaching the emulsion After the exposure the plate is developed and then bleached in acid permanganate which dissolves the silver negative image but does not attack the unexposed emulsion An exposure to white light now makes the remaining area developable and after the second development a positive image is obtained The process of bleaching exposing, and redeveloping is known as a *reversal* process because the original negative is converted into a positive

The Agfa color plate was originally announced in 1916 but was not introduced until 1923 This plate has a three-color screen similar to tbat of the Autochrome, except that dyed particles of gum arabic rolled out in collodion are used Color screen methods were first applied with some commercial success to roll film and film packs by the Lignose Company of Berlin in 1927

The Paget screen plate introduced about 1912 was very popular for several years The color screen and the sensitive emulsion were on separate plates thereby eliminating some of the difficulties of screen plate manufacture In the event that the picture was spoiled, the screen could therefore be used again When binding up the transparency it was somewhat difficult to register the color screen Although withdrawn from the market for a few years the plate has been introduced again under the name 'Duplex Color Plates "

Numerous other screen processes have been worked out but very few of them compare with the Autochrome in quality and fineness of the screen particles, the uniformity of the product and the beauty of the color rendering Even the Autochrome process has certain limitations however for it is necessary to use a very thin emulsion coating and such a coating bas a narrow range of gradation or ability to reproduce a scale of tones The plates are also very dense and require stronger illumination than ordinary plates for projection.

Bi-pack and Tri-pack Methods Numerous methods of exposing two or three films simultaneously have been suggested The films (or plates) are arranged as a pack so that the two upper films (or interposed filters) transmit certain portions of the light in exposing the different layers, and a set of three-color separation negatives is obtained The order of exposure varies with different processes, but the usual procedure is to place the blue sensitive film uppermost then the green and then the red It is impossible to obtain critical sharpness by such a method although some rather pleasing results have been produced

(*Continued on Page 24*)

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16—All moving parts inclosed and running in oil except intermittant movement

Principles and Processes of Photography in Natural Colors

(Continued from Page 22)

(b) Two Color Additive The majority of transparency processes are three-color processes but a few two-color additive methods have been worked out A two-color line screen process has also been suggested

(2) Color Reproduction by Subtractive Processes

Thus far we have discussed methods whereby the final picture is made by superimposing or adding up the light from three primary colors In nature however substances are not colored in this way, but, instead they absorb or subtract certain component parts of the visible spectrum of white light and reflect the remainder It is this composite reflected portion which is the color the normal eye records as the natural color of the object

(a) Three Color Methods When preparing a three-color transparency by the subtractive process it is necessary to make three positive color records either on thin gelatin coated films or tissues and superimpose these in register Methods of securing these positive color records may be classified as follows: (i) dye mordanting and toning methods (ii) carbon (or pigment) transfer, (iii) imbibition (iv) hard and soft gelatin methods and (v) relief processes

(i) Dye Mordanting and Toning Processes In these processes positives are printed from a set of three-color separation negatives and the silver image on each positive is changed to a compound salt which will mordant or absorb basic dyes The final dye images are distributed throughout the original gelatin film so that the entire film must be transferred to the final support

It is quite difficult by chemical toning methods to secure true complementary colors, but nevertheless some very pleasing results have been produced Iron toning is occasionally used to produce a blue image and mercury (iodide) gives a yellow image but there is no satisfactory toning method known for making a red image, although the reddish brown image obtained with uranium toning has found some adaptation Toning methods are sometimes used in conjunction with other color processes

(ii) Carbon or Pigment Transfer This process makes use of a property that bichromated gelatin possesses of becoming tanned or hardened when exposed to light If a plate is coated with bichromated gelatin and is placed behind a negative as in Fig 11, and then exposed to light only those parts of the bichromated plate which the light does not reach will remain unhardened and therefore soluble in hot water while the parts exposed to the light will be insoluble in hot water

Exposure is usually made through the back of the film or plate in order that the delicate highlights may not be washed off during the hot water development After the soluble parts have been removed the image remaining may be dyed up by choosing dyes which are absorbed by tanned gelatin The dyes must be complementary* to the filters through which the negative was exposed thus the green filter picture is dyed magenta the blue filter picture is dyed yellow and the red filter picture is dyed blue-green When the three positives thus obtained are cemented together in register a transparent color reproduction of the original subject will be obtained

(iii) Imbibition Processes Transparencies by the imbibition process consist of dye images in a single gelatin layer When a dyed relief image in gelatin is brought into intimate contact with a plain gelatin surface the dye tends to wander to the other surface or become imbibed by the gelatin Such imbibed images are inclined to be fuzzy and expedients are therefore taken to prevent spreading of the dyes Registration of such images is also very difficult but very pleasing results have been obtained

(iv) Hard and Soft Gelatin Process A process was introduced in Germany in 1906 known as the pinatype which utilized the fact that certain dyes will stain soft in preference to hard gelatin The process as originally introduced was tedious as it required nine separate printings Three transparencies are prepared from the original three-color separation negatives and three print plates on bichromated gelatin from the transparencies The print plates are then dyed up with dyes which are only absorbed by soft gelatin and a positive image is produced on the print plate which contains an invisible negative image of tanned gelatin The dye image may subsequently be transferred to another surface if desired

(v) Relief Processes There are three methods commonly employed for producing a relief image in gelatin, (a) the use of the tanning action of a bichromate solution on the gelatin around the particles of silver comprising an image The gelatin relief can then be stained up and used as a matrix (b) The use of an oxidizing solution such as hydrogen peroxide which dissolves away the image and attacks the gelatin immediately around each silver particle comprising the image The gelatin film is then washed, fixed, and dyed (c) The use of the tanning action of an oxidized developer on gelatin to form a relief image which is subsequently dyed up In (a) and (c) the silver image is removed by treatment with a reducer before dyeing In addition to the above methods of securing a relief the tanning action of light on bichromated gelatin may also be used as described under carbon or pigment transfer methods

(b) Two Color Methods Because of the complication of a three-color process, several investigators have tried to perfect a two-color subtractive process The possibility of getting satisfactory results with the subtractive method is somewhat greater than with the additive method With the latter, two colors must exactly balance each other or be complementary to one another in order to obtain true whites and blacks In the former or subtractive method, whites are obtained by the absence of color and blacks by using both colors in full strength so that colors may be used which are not exactly complementary and the range of usable colors is greatly extended

The method of preparing transparencies or lantern slides by this process is essentially the same as for a three-color subtractive process The final result consists of two plates films or tissues which have been dyed by some suitable method and then superimposed in register

The Kodachrome process of color portraiture introduced in 1915 made use of the property possessed by certain dyes of staining soft in preference to hard gelatin Two plates were exposed behind their respective filters developed, and then converted without fixing into dyed positives This process used a tanning bleacher which removed the original negative image and simultaneously hardened the gelatin in proportion to the amount of silver image present

For portraiture a two-color subtractive process is admirably adapted It is also useful for photographing certain flowers, still life, or fashion scenes in which reds greens or orange predominate It is unsuitable, however for landscape work where there is an excess of blue, blue green, and violet For clinical and photomicrography it finds useful application

B Color Processes Yielding Prints to be Viewed by Reflected Light

Although most of the color transparency processes are capable under certain conditions of yielding color prints, the majority of the print processes of commercial interest have been worked out primarily as print processes The average individual prefers a photograph that can be examined in the hand or hung upon the wall to one which must be held before an illuminator or projected upon a screen

1 Additive Print Processes

Numerous attempts have been made to perfect an additive color print process but none have met with any practical success Subtractive processes are much simpler to work and the majority of print processes therefore have been subtractive methods

2 Subtractive Processes

All of the methods described previously under subtractive transparency processes are adaptable to making prints The final stage of the process usually consists in superimposing two or three color tissues or gelatin films in register or transferring the image by imbibition to a paper support

(a) Three Color Methods

(i) Dye Toning Processes More or less degradation results by this method as the colors often wander and the print is usually rather dark because the light has to penetrate several layers of film and be reflected back through them Ives' Hichrome process is one of the best examples of this method

(ii) Transfer Processes Under the general term transfer processes may be grouped those methods of producing color prints wherein bichromated tissues containing the respective color records are transferred from their original support to a paper support Three color carbon prints are prepared by applying a mixture of gelatin and pigment to a thin piece of film support sensitizing the gelatin in bichromate solution exposing under the respective color negative through the film side of the tissue dissolving off the soluble gelatin in hot water and mounting gelatin side down on a piece of smooth white paper After the sheets have

(Continued on Page 44)

*Complimentary dyes are those which absorb the light which the filter dyes transmit

MULTICOLOR



Hal Mohr A S C, Chief Cinematographer, and Roy D Hunter, supervisor of Sound, for the great Universal Films organization endorse the MULTICOLOR PROCESS Their opinions are the result of careful investigation and have years of thorough and successful experience as a background

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—standard cameras are used every Mitchell, Bell and Howell and new Fearless silent camera is a potential Multicolor camera

—color and sound-on-film in one process for dailies and release prints

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Studio and Laboratories

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In Africa

(*Continued from Page 9*)

suggesting a seat The Bell & Howell and I were mounted at this end with the other end well across the cross-bar on the parallel, and half a dozen or so natives hauling on a block-and-tackle furnished the motive power. Maybe our crane wasn't as big and fancy as the one Hal Mohr plays around on at the U', but it worked—and that was all we cared about

'Wild animals? Of course we saw a lot of them but we were out there to make pictures not to hunt thrills We'd have been perfectly satisfied if we'd been able to get along without any of that kind of excitement—until the picture was finished Of course we couldn't Africa isn't like that We all ran into a few tight squeezes in spite of everything. My own? Well soon after I got out there I was treed by a herd of buffaloes—and believe me those African buffaloes are tough hombres The natives say it's a toss up between them and the rhinoes as to which is the fiercest and ugliest-tempered brute on the plains I didn't meet any full-grown rhinoes so I'll vote for the buffalo every time Of course we had most of the usual adventures with lions, and that sort of thing, but the nearest I came to doing a quick fade-out was near Murchison's Falls, in the Uganda when a crocodile nearly got me We had corralled a bunch of the brutes in a pond where we were going to shoot some scenes they were needed in Everything would have been all right if we hadn't had about four days of unbroken bad weather

The 'crocks' began to get restless and tried to get back into the Nile, where they belonged so we had to stand guard around the stockade they were in or lose our 'crocks' At first burning torches were enough to make them behave but in time they grew used to them, and we had to pepper them with 22 rifles Now, a 22 bullet.—even a long rifle cartridge—isn't enough to more than annoy a crocodile but for a while, we succeeded in keeping order with them Finally one of the brutes decided that he was going to come through the place where I was on guard—and, believe me, he *came*! My torch didn't faze him at all he grabbed it right out of my hands, and kept right on Then I peppered him with my 22, but though I emptied it down his throat it didn't do any good at all He kept right on coming—and I didn't have any more weapons, nor any place to jump to, so I began to figure it was 'curtains' for me when one of our white bunters got near enough to finish the brute with an elephant-gun One more inch though, and it would have been my finish instead of the crock's' But after all, my closest shave wasn't in Africa at all, but in New York where only the grace of God and a friend's strong arm saved me from a man-killing taxicab!

'To me, though the most outstanding feature of the trip was the wonderful aid our radio set was We'd found it a great help on the last two pictures, in the South Seas, so on this one we took a specially built outfit, designed just for expeditionary work As you know we established our base in Nairobi, including our laboratory business office, etc and by means of our radio, we were able to be in constant touch with affairs Our operator at that end was an enterprising radio amateur named Pegrume, without whose aid our trip would have been a thousand times more difficult As it was we two handled more than 25 000 words of traffic between us without failures or error—a really remarkable record, considering the conditions and that we're both amateurs

'Of course, once or twice I reached out farther, and 'talked directly to the States but as wire and radio communications are a British Government monopoly and jealously guarded we confined ourselves to keeping in touch with Nairobi most of the time. That was of inestimable value to us in every way On one occasion, for instance, Mr. Van Dyke and I were going into Belgian Congo, to photograph the pygmies there and the rest of the outfit was broken up into several parties to reassemble at a given location several weeks later. But the weather in the Congo turned out bad with no hope of any improvement so Van decided to change his plans By means of the radio we were able to get the others together almost at once saving many valuable weeks

"There were countless other instances like these, of course during the ten months we were out, but, after all, as far as I'm concerned—and I think the others agree with me—the real high spot of the trip was seeing Hollywood Boulevard again! You can say all you want to about Hollywood but it's home to us— and there's no place like it!"

Reeltone Pictures Co.

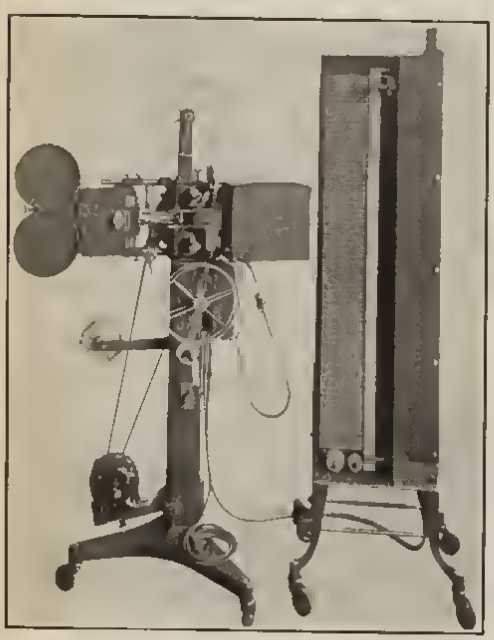
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Depue's Optical Printers *now made for standard size printing!*



The Standard size will do many kinds of printing. It will eliminate the sound track by sligbtly enlarging, also furnish a sound track by slightly reducing. Will print reverse motion, stop motion, lap dissolve, fade in and out. Print miniature or enlarge from sections from Standard negatives for close ups. Space for wratten filters provided. Also for camera masks.

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At Last It Is Possible!

For many years Directors and Camera Men have desired special effects in their films after the sets have been sbot and dismantled, or it is too late or too expensive to make a retake. Such effects as making a long shot into a close-up, putting in lap dissolves and fades, making a miniature of a scene and double exposing it over anotber scene, and otber special effects.

To meet this situation, the Burton Holmes Laboratory has installed one of tbe new DEPUE 35 mm. Optical Printers whicb will do all of the above stunts and many more.

Keeping abreast or ahead of the times bas always been tbe policy of tbis organization.

Burton Holmes Laboratory

7510 N. Ashland Ave. CHICAGO, ILLINOIS

Harvard and Pathe Plan Film Series

IN cooperation with Harvard University Pathé will at once start production upon two series of educational motion pictures in which talk will be used wherever advisable, according to Joseph P Kennedy, Chairman of the Board of Pathé Exchange Inc Thus sound will become a part of instruction by the motion picture It is the belief of Harvard officials and Kennedy that the addition of sound to such pictures will add immeasurably to their effectiveness as a pedagogical aid

One series will be a comprehensive and exhaustive treatment of ' Regions of the United States The other will be on Commerce and Industry ' In the first mentioned the eight separate geographic regions will be the subject of the pictures in the second the basic industries of the country

Plans for these educational pictures have been prepared by Dr Kirtley F Mather, Dean of the Department of Geography at Harvard, under whose supervision the films will be edited Pathe will produce them Distribution will be handled by the Educational Department of Pathe through thirty-one branch offices in the key centers of the country

The Regional Series will show the physical aspects recreational scenic attractions resources industries, principal cities historic landmarks, development of commerce and industry and the influence of commerce industry, and transportation on each of the regions and its cities These regions are New England Middle Atlantic, South Atlantic- North Central Central Gulf, Rocky Mountain and Pacific Coast states The series will comprise sixteen reels of film and the contents so arranged that each reel may be used separately

The Commerce and Industry Series will comprise films on Vegetable Products Forest Products Animal Products- Mineral Products Transportaton Communication and Public Service and Marketing and Manufacture It will include twenty to twenty-five separate subjects- Each of the pictures in the series will discuss the history and development of the basic industries of the several regions the influence of each industry on the commerce and development of each region and the country as a whole the methods employed in production or in the service rendered and the use of the product by the public served

Early History of Wide Film

(Continued from Page 5)

very risque in those conservative days The May Irwin Kiss, Little Egypt Loie Fuller's fire dance Bridget Serves Salad Undressed and many others brought gasps of amazement at their audacity

On November 3 1899 the Jeffries-Sharkey fight was held at Coney Island at night Wm A Brady now well known in the theatrical and motion picture world and a promoter named O'Rourke sponsored the bout and induced the American Mutuscope and Biograph Company to film the fight

The film used was 2¾ inches wide and each frame was 2¼ inches high Three hundred and twenty feet of this wide film was used per minute, the perforations being made in the camera at the instant of taking

The fight lasted for twenty-five rounds of three minutes each and more than seven miles of film were exposed Four cameras were on the job so as to obtain a continuous record Buckling of the film in the cameras was frequent although the film could be watched through a red glass peep-hole by the light of a small ruby lamp inside the camera box

The perforations in the large Biograph film were used in printing but not in projecting The projector pulled the film down by means of a set of mutilated rubber rollers and the projectionist had to watch the frame continuously to prevent creeping of the frame line on the screen

Oscar B. De Pue, partner of Burton Holmes, in 1897 purchased a machine in Paris from Leon Gaumont for taking 60 mm. wide film then put up in one hundred foot lengths unwinding and rewinding inside the camera on aluminum spools not a daylight proposition but a dark room model This machine he took to Italy and the first motion picture turned out on the machine was of St Peter's Cathedral with the fountain playing in the foreground and a flock of goats passing by the machine He then took other pictures of Rome and from there visited Venice, where pictures of the canal and Doges Palace and the waterfront along the canal with views of feeding the pigeons at St Marks with the great cathedral in the background From there to Milan for a scene of the Plaza in front of the Milan Cathedral thence to Paris where pictures of the Place de la Concord with its interesting traffic and horse drawn busses, fountains obelisks statues, bicycles, wagons trucks and carriages were made All the life of that day, after thirty-two years is in striking contrast to the present.

These negatives are still in his possession although the prints for them have long since been lost track of on account of our having changed from that size of picture to the standard size

This Gaumont wide film camera was used for five years by Mr De Pue and most of the negatives many of which are of great historic value, are still in good condition, so that either full size or standard sized reduction prints can still be made from them

Spoor and Bergren have worked for more than ten years upon a 63 mm. film called Natural Vision pictures

Widescope first sponsored a double frame picture on standard film with the film travel horizontal instead of vertical, after that an Italian patent was acquired in which a wide film of about 2¼ inches width is held in cylindrical form about the axis of rotation of a revolving lens so that the succeeding frames are photographed on the same principle as in a panoramic still camera Unfortunately this method of taking pictures introduces the same curveltnear distortion often noticed in cirkuit and other panoramic still photographs

Fox Grandeur pictures are 70 mm in width with a frame 48 by 22.5 mm leaving space available for a sound track about 10 mm wide

Lorenzo Del Riccio, a member of the society is perfecting for Paramount the Magnafilm This film is 56 mm. wide and the frames are 19½ mm high

Several other sizes of wide film are being used experimentally and other new sizes are being advocated but these are current and not early history and do not properly belong in this chronicle

Fearless Camera Company

RALPH G FEAR, head of Cinema Equipment Co., announces that on January 1 1929, the firm name will be changed to Fearless Camera Company The change of name," says Mr. Fear, does not denote a change in ownership or of policy We are doing business at the old stand, and we feel with the advent of the New Fearless Silent Camera, in a bigger and better way"

New Fearless Camera

(Continued from Page 11)

One of the noteworthy features of the Fearless Silent Camera is the method of shifting for focusing and returning to shooting position Instead of shifting the entire camera head the lenses and their mounts are shifted by the simple process of turning a lever conveniently located at the rear of the camera This requires merely the effort exerted in turning a small lever with thumb and forefinger The lenses are in micrometer mountings that are mechanical precision itself and will delight every cameraman The turret has been so designed that all the lenses together with their mounts may be removed in less than one minute A simple follow focusing device can also be supplied

At the side of the camera are located four separate driving shafts These are designed for the plug-in type of motor One drive shaft is for 60 cycle current, one for 50 cycle, a third shaft is for highspeed work and drives the camera through a built-in three speed transmission. The fourth is for hand cranking at normal speed At the rear of the camera is a fifth drive shaft for stop motion work A footage speedometer with a large window and generous size figures is provided. This speedometer may be removed from the camera at will It will be apparent that this method of providing for the different cycle currents is of tremendous value not only obviating the need for different motors but is an additional assurance of quiet motor operation because the reduction gears are in the camera operating in oil rather than in the end-bell of the motor

The disolve is controlled from the rear of the camera A convenient lever controls the mechanical dissolve which operates through a gearset that provides for three different speed changes A dial indicator calibrated to show percentage of shutter opening is provided

Built into, and a part of the camera is the Fearless Automatic Film Tension control which has proven its worth in over a year of use This prevents film buckles by varying the tenston on the take-up belt Another feature is the Electric Circuit Breaker which instantly stops the motor in the event of a film break or at the end of the reel It is also an added safety factor, for if the film should buckle by reason of breakage of take-up belt or for any other cause, the Circuit Breaker will instantly stop the motor and camera

For recording purposes the Fearless Silent Camera can be furnished with an auxiliary sound photographing aperture, at the correct distance of 19 frames from the photographic aperture, and with gears, rollers etc necessary for recording the sound directly on the film as it passes through the camera A Fearless Recording Photo Lamp or any standard light valve may be attached and when so equipped it may be connected to any recorder amplifier and the sound record made on the same negative as the picture being photographed This should prove a boon to newsreel cameramen and to location expeditions that are remote from electricity for in cases of that sort the camera motor may be operated from the batteries that provide current for the recorder amplifier

The Fearless Silent Camera can be furnished for donble-width film or for the Fearless Wide Picture on standard 35mm film Of special interest is the fact that colored motion pictures by the Multi-color system may be taken with the New Fearless Silent Camera

Lack of space prohibits enumerating all of the unusual features of the Fearless Silent Camera Suffice it to say that it is the finest motion picture camera ever manufactured for the professional cameraman and is in every sense a 1930 model camera

Petroleum in Pictures

AN UNUSUALLY interesting four-reel film dealing with the operations of the petroleum refining industry has been prepared by the United States Bureau of Mines Department of Commerce, and is now available to schools churches civic bodies, etc., at no cost except transportation

As an educational film this picture is outstanding, for it reveals phases of the industry that are little known and which are of unusual interest Great care has been taken in the making of the picture so that it is really educational and interesting rather than just plain propaganda

50-50

(Continued from Page 10)

splitting his head with an ache to find out that Bladdich, on surprise charges filed by investigators sent from the firm's New York offices had been indicted and arrested on charges of defrauding his employers of thousands of dollars, which he had spent on a certain number of blondes, red heads and brownettes it appeared, in a paragraph toward the end that one Simon O Rourke had taken Bladdich's place and plush-fitted office

"Mebbe" soliloquized Mannie this guy O Rourke'll gimme back my job"

Mannie telephoned O'Rourke He explained to O'Ronrke who he was Oh—yes, yes" yelled O Rourke, strangely excited, Mannie thought "We've been hoping to hear from you Be sure to see me today won t you?'

Dazed Mannie said he certainly would It was all very odd Mannie thought Why should O Rourke want to see him? Well—chance to get the job back Mannie considered and so—having quite forgotten about the letter he had written Bladdich—Mannie hurried to his hotel to get into some clean clothes to see the new boss for a job

At the hotel, there were two envelopes in his letter box One was the hotel bill with a memorandum in red ink which began "Unless—' The other knocked Mannie so cold that it was 4 38 that afternoon before he recovered sufficiently to take a taxi to O'Rourke's office It read briefly like this

'Mr Cass Mandell
Hotel President
Hollywood Calif
My Dear Mr Mandell

This is to advise you that Mr Michael V Bladdich is no longer with this corporation and that the undersigned has been appointed to fill his place

Among the material left by Mr Bladdich when he departed I found a letter from you You appear to have anticipated the findings of our own private investigators who have been examining Mr Bladdich s record and performances

That is however beside the point The purpose of this letter is to ask you to see me at your earliest convenience We are about to begin production of our big feature for the year—a war story with the working title of 'MARINES ARE LIKE THAT!" We have been seeking with very little good luck for a dialogue writer with vocabulary command of language intensity of imagination and incandescence of expression to do the material which will form a large part of the dialogue in this production Your letter to Mr Bladdich leaves absolutely no doubt that you are the man we want

If you care to resume your connection with us at double your former remuneration we have a contract awaiting your signature

(Signed) SIMON O'ROURKE'

Portable Recorder

REELTONE Pictures Company announces they have been licensed to use the Tanar Recording Light which was developed by Len H Roos A S C They promise deliveries of portable recorders for newsreel and industrial work in thirty days Those who have seen the recorder say many nice things about it We hope to give more about it in next issue

Roy Davidge Film Laboratories

Negative Developing and Daily Print exclusively

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"Hell's Angels" Completed

(Continued from Page 16)

Lena Malena and Wyndbam Standing

Producer-Director Hughes, himself an expert licensed pilot, has established a record for all time in motion-picture extravagance in the filming of his air classic On air scenes alone he has expended nearly $2 000 000 and the total distance covered in the mimic sky battles was approximately 227,000 miles More than 20,000 extras were employed in the various mob-scenes of the picture. Total cost of "Hell's Angels" will approximate $4 000,000, according to Hughes

Harry Perry ASC, had charge of the aerial photography and Tony Gaudio, ASC, was chief cameraman for the non-flying sequences silent and talking

The largest air-fleet ever assembled, except by governments, participated in the picture The aerial squadron comprised 87 planes including more than 40 true wartype ships The air-fleet included German Fokkers, British T M's S E 5's, Avros, DeHavilands, Snipes a German Gotha bomber and a zeppelin A total of 137 pilots, and as many mechanics were employed during the 18 months filming of action above the clouds The pilots included practically every stunt flyer and ex-war ace in America A technical staff of 35 cinematographers including 26 aerial cameramen, and a staff of 12 editors and cutters were on the Hughes' pay-rolls during the two years of elapsed production

Eight separate locations were maintained for the aerial sequences They included the main flying base at Caddo Field Van Nuys a training school camp at Inglewood a German field at Chatsworth, and other locations at Santa Cruz Encino Ryan Field San Diego March Field Riverside, and Oakland airport, Oakland California

At the latter airport the "Hell s Angels' sky fleet was in action for more than four months filming mass air-battles in which 40 planes participated simultaneously.

The same lavish enterprise was displayed in the operations on terra firma A charity ball in London at wartime screened in technicolor, has been reproduced with more than 1 000 extras supplying background and atmosphere Another 500 extras appear in a costly German beer-garden setting and the same number in French cafe scenes.

More than 2 000 000 feet of celluloid were consumed by 'Hell's Angels" cameras during the period of production The completed picture will be shown in 12 reels, or approximately 12 000 feet.

Whether Howard Hughes will ever see a return of the tremendous sum invested in 'Hell's Angels" is one of the moot questions in Hollywood Many insist it can't be done Others, better acquainted with the spectacular business methods of filmdom s youngest producer and director believe he will out wise them all and emerge with a bigger bank balance than ever

In his previous screen ventures 'Two Arabian Knights,' The Racket" and 'The Mating Call, Hughes averaged from 50 to 100 per cent profit on his investments despite his extravagant production methods and despite the fact that he paid handsome dividends to the companies which released his output

With "Hell s Angels" Hughes will deal directly with the public leasing his own theatres and road-showing his picture wherever movies are shown He has already leased the George M Cohan theatre on Broadway for a year's run and will next seek leases on houses in Los Angeles Cbicago, Philadelphia, Boston Cleveland Detroit, San Francisco and other key centers

Max Factor Leads

A RECENT survey of the sale of cosmetics by the Domestic Bureau of the Los Angeles Chamber of Commerce reveals the fact that ninety-six per cent of the cosmetics used by the stars featured players and the motion picture studio make-up department heads are Max Factor products

Since the earliest days of the motion picture industry, Max Factor products have been in general use in fact, as the discovery of proper make-up for the screen is attributed to the cosmetic chemical genius of Mr Factor, there has never been used to any real extent any other make up but his



Still by John Fl...

Bernice Claire

IN

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Max Factor's Theatrical Make-up for the Stage

New Tri-Dimensional Cinematic Process Claimed

THIRD DIMENSION, or depth of perspective in standard motion picture photography is the claim advanced by William F Alder Vice President and Chief Engineer for Colorart Synchrotone Ltd This he claims has been achieved without the use of special cameras film or projection equipment, removing it from the class of laboratory experiments into the realm of practical studio matters

The basic patents of Adler s Tri-Dimensional process were granted in 1915 but the mechanical apparatus has only recently been refined to the point of what he claims is production practicability Its underlying principle is that of the motion picture itself—the illusion brought about by the persistency of vision Instead of using special bi-lensed optical systems and individual viewing filters Mr Alder used standard apparatus throughout adding an attachment by visual persistence The means used to attain this end is merely the photographing of alternate frames from laterally varying positions or rather, angles, since the optical centre of the lens is the pivotal point The device itself is an intricate train of gearing and compound cams built into a special tripod and operated by a synchronous motor An adjustment is provided which controls the angle through which the camera is moved, thereby adjusting the proportion of stereoscopy to the need of the moment

The device was demonstrated to a gathering of press representatives, who were amazed by the naturalness of the photography A number of interesting test scenes were shown among them being a garden scene with trees and foliage in the far distance back of which was a partly-hidden cottage It was noticeable that the distance between the trees and the house was well defined and that the house stood out with a natural depth while the figures were distinctly defined to an unusual degree The roundness of the bodies was particularly noticeable.

Wilky Back

Guy Wilky A S C has returned from the South Seas where he was photographing a picture that Murnau was directing Next month Wilky will have a special story in the *Cinematographer*

Strenge Heads N. Y. Union

WALTER Strenge of Pathe has been chosen as president of the International Photographers Union Local 644 Other new officers are 1st Vice-Pres , Al Wilson 2nd Vice-Pres , Harry Wood 3rd Vice Pres James Pergola Treas Frank Kirby, Sec , Walter Lange, Sgt at Arms Emil Harris Three trustees were elected as follows William Steiner Jr (3 yrs), L Fiferlik (2 yrs) Al Gold (1 yr)

Appointed to the Executive Board are Geo Folsey Larry Williams, Charles Downs William Miller Carl Gregory Burt Pike Dan Caveli Al Gold Thos Hogan Frank Broda Jay Rescher, Herman Zerrener Herman Obrock Ray Foster Chas Gilson and Frank Zucker

700 Silent Houses

Cleveland—Fifty-two silent pictures have been secured by the Standard Film Service Co for release to 700 silent film houses in Ohio and Kentucky

Rudolph Heads R.C.A. Publicity

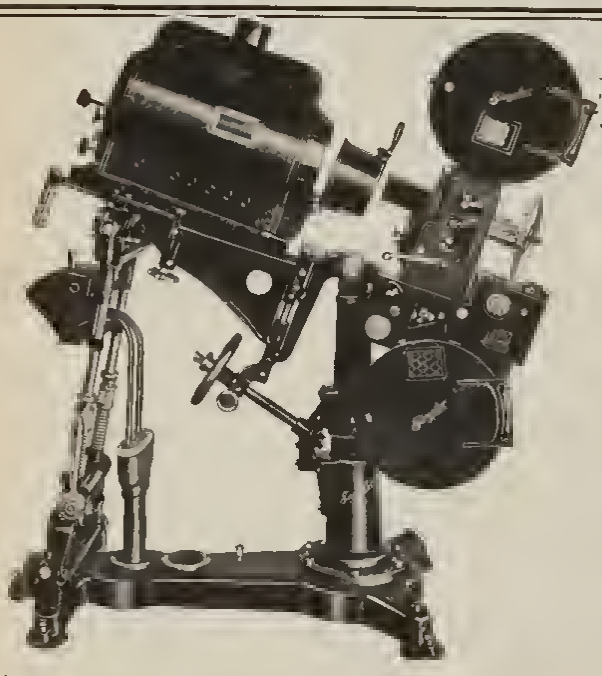
GERALD K RUDOLPH has been appointed director of publicity for RCA Photophone Inc advises Charles J Ross vice-president Rudolph before coming to New York was managing editor of a Buffalo newspaper and has been identified with the industry for the past seven years

McNamee in Pictures

GRAHAM McNAMEE radio announcer for National Broadcasting Corp , has been signed by Universal to become the Talking Reporter for the company's sound newsreel Pictures of the signing of the announcer were taken and will preface the first of Talking Reporter series in which the famous broadcaster will appear

New Technicolor Plant

ANOTHER $1 000,000 plant which will supplement the two other laboratories here and the two in Boston is being erected in Hollywood by the Technicolor Corp Work is being rushed to have the new plant in operation early next month Eventually this plant will have a capacity of 47 000 feet of colored film daily or about 75 000 000 feet a year



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Amateur Movie Making

By WILLIAM STULL A. S. C.

Resolutions!

NOW that Christmas is past and New Year's at hand, those of us who have survived the horrors of Holiday hospitality and Christmas neckties are beset with the traditional spectre of New Year's Resolutions. Of course, no one has yet been known to keep a New Year's resolve, but the distressing tradition of making them still persists. One simply must resolve about something each January First, willy nilly. Keeping the resolution is quite another matter, and socially unimportant. After all, those Christmas smokes must be used up some way—and as for really climbing on the wagon—!

Still, if one were to take New Year's resolving seriously for a change, it wouldn't be so hard to find a few resolutions which would be helpful and even profitable to keep. Amateur Cinematographers in particular could benefit by a few well-kept cinematic resolutions. At the risk of seeming painfully obvious, I'll suggest a few here.

First: *Be it resolved* to hereafter employ brains as an inseparable accessory to the use of the cinema camera. (Movie cameras are only foolproof as long as they are not foolishly operated).

Second: *Be it further resolved* to master each step in technique before essaying the next one. (Walking must be learned before running, and mechanical proficiency before pictorial artistry.)

Third: *Be it further resolved* to diligently cultivate the art of being patient. (Cinematic haste makes wasted film and discouraged filmers.)

Fourth: *Be it finally resolved* as a cinematographer to so order my photographic life as to preserve and increase the good name of the craft. (Slipshod incompetence has no business behind a movie camera where it can jeopardize the photographic reputation of the whole army of professional and amateur cinematography.)

Such a set of simple cinematic resolves, rigidly adhered to, could work wonders, even in the short space of a year. Of course they are no magic panacea, but their observance would be a great step toward success in the exacting field of cinematography.

Interiors

During the winter months when most amateurs have little chance to use their cameras out of doors, indoor filming offers a world of inviting opportunities. Aside from the conventional types of interior scenes, with which most amateurs are familiar, there are many special effects which invite the artistic experimenter. For instance, the great range of fascinating low-key portrait effects possible with only a single lamp or spotlight, and a reflector or two. Many interesting back lit effects for example can be made with a single lamp and reflector, placing the lamp just out of the picture, to one side of, and a little behind the subject, with the reflector taking care of the front-lighting. Altering the positions of light and reflector, their heights, diffusion of one or the other, and changing the camera-anges will make possible an almost infinite variety of striking effects. The use of a mirror in the background, with the subject and lighting arranged so that the glass reflects only a few highlights from the subject is also effective.

In all of this sort of work, a most useful accessory is the sort of a shield called in studio parlance a "nigger." It may be a narrow black screen, a foot or so wide by five or six feet high, or a small, square sheet of black-painted compo-board to be held in the hand or hung on a lamp. In either case "niggers" are important in shielding the lens of the camera from unwanted rays from the lights.

Cine-Silhouettes

But there is also a great range of interesting effects quite apart from the more conventional ones. Perhaps the first is the cine-silhouette. This, of course, is a comparatively simple affair, involving only the use of a translucent screen of sufficient size with a strong, even source of light behind it, and the placing of the subject or subjects in front of it, quite close, in profile. In silhouette making, it is advantageous to have particularly powerful lighting equipment in order that the lens may be stopped down to increase the sharpness of the image to the critical point.

In addition to the true silhouette there is also the semi-silhouette, in which the figures are sharply outlined against the light background but have also some front lighting as well. This effect can be secured either by the use of reflectors and mirrors placed beside the camera or by small additional lights used similarly.

What might be termed ¾ silhouettes are very effective, too, and are made by so placing the characters in relation to the light source that a little light diffuses on their faces giving a suggestion of normal photographic relief while the rest of the figures are in sharp silhouette. The effect can, of course, also be obtained by the careful use of small reflectors.

"How far that little candle throws its beam . . ."

Another interesting device is a candle-light effect. This is simply an ordinary one sided, contrasty lighting, with the subject holding a lamp or candle from which the light seems to originate. It is particularly effective with children but can also be used to good purpose in the amateur photoplay. The method, of course, is simple, merely planning the action so that the candle remains in relatively the same location, and then placing the light source just outside the picture, at the same elevation and general position as the candle. The light may be either diffused or not, as the individual may prefer, although a light diffusion is probably best.

Still another simple indoor lighting effect is that of firelight. This can be made by placing either a lamp or a magnesium flare in the fireplace, and grouping the actors around as may be desired, but always keeping one (or a piece of furniture) between the 'fire' and the lens. These effects can be made either with

(Continued on Page 42)



Photo by Clifton L. King



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INFORMATION FOR AMATEURS

Amateurs—Send your problems to this department and we will solve them

Question. Why do my pictures of moving automobiles and galloping horses almost always come out blurred? Can it be avoided?—R. H. B. (Boston)

Answer. This is probably due to the fact that you are shooting them from the side, and too near, therefore, in the comparatively long period of exposure (about 1/30 sec.) the image moves across the film, making the blur you notice. In professional cameras the shutter opening can be adjusted, thereby making it possible to reduce the exposure to a short enough period to 'stop' the motion. In amateur cameras this cannot be done, so the amateur must contrive to reduce the motion of the image across the film. The simplest way to do this is to shoot from a different angle, making the moving subject come more or less head-on into the picture. If this is not practicable, or the scene must be shot from the side, the further the camera is from the object, the smaller the blurring movement will be. Alternatively, if one must be close up, panning 'round with the subject, keeping it as nearly as possible in the centre of the picture, will also help.

Question. How can I prevent the reflections of my lights in polished furniture, the nickel work of autos, etc.?—A. T. B. Philadelphia.

Answer. Rub the offending article over with a piece of putty just before shooting. It can be easily removed afterwards.

Question. Can I get trick effects with my Victor? For instance, pouring water—or beer—out of a bottle into a glass and then having it return into the bottle?—I. D. B., Milwaukee, Wis.

Answer. Easily. In the first place, use a tripod. Then photograph the first part of your scene in the normal manner. Then stop the camera, and replace it on the tripod, but *inverted* (there are clamps made to hold cameras in this position), and re-take the action. When the film comes back from the finishing station, cut out the second part of the scene, splicing it in again right side up. In order to prevent too great a 'jump' in the scene where the two strips are joined together, it is well to make sure that in both cases the lens occupies about the same position, with relation to ground and subject.

Question. For interior shots by artificial light, which is faster, ortho or pan film?—A. E. G., Vancouver, B. C.

Answer. It depends on the source of light. For white flame arcs, Ortho stock is appreciably faster; for incandescent lights, pan is faster.

Q. Is there any possibility of selling 16mm. films for newsreel use?—V. N. P., New Orleans.

A. In the case of exceptional shots, there is such a possibility. There have been several instances of cine amateurs being on the spot when some unexpected and important event occurred, and subsequently selling their films to one or another of the big newsreel firms, who in such cases are glad to get any sort of film for an exclusive 'story.' Of course the photographic quality of a picture suffers in the enlargement, but in the case of an exclusive subject that is overlooked. Now, too, that sound newsreels are so much the style, the amateur's chances are considerably lessened, but by no means wiped out, if the subject is important enough and exclusive, it will still sell. If need be, it could be run silent or sound "dubbed" into it. But in all dealings with newsreel outfits remember that ample footage and speed of delivery are the keynotes. Seconds count in this work, so don't be afraid to use the fastest means of transport available in every case.

Lab. Head to Lecture

JOHN NICKOLAUS, head of the M-G-M laboratories and widely known as an authority on screen photography, is now in New York to give several lectures before scientific bodies and to study new laboratory methods. Among his many inventions, Nickolaus is credited with the "relative movement" method of three dimensional photography, the solution of the 'wagon wheel" problem of filming wheels without their appearing to turn backward, the first undersea pictures and other achievements.

Your Makeup Problems



By MAX FACTOR

[Internationally Known Authority on Makeup]

DEAR MR FACTOR —I would appreciate your answering a few questions which have been bothering me for some time Is your Masque for the eyelashes harmless? If so why is it so painful? I am a dark brunette with brown grey eyes Do you think I could wear blue eye shadow? The brown seems to have no effect What is the best means of removing make-up? What cream is used by the profession?

Thanking you so very much for your attention I am

R S

ANSWER —Max Factor s Masque is entirely harmless It is made on a pure soap base and any soap, regardless of how pure it is smarts when it gets in the eyes I think the grey eye shadow would be a good color for you as it has a bluish cast when worn Make-up is removed with Max Factor s Cleansing Cream or the new Max Factor s Liquid Cleansing Cream Both these creams are used by the profession

DEAR MR FACTOR —For evening should one wear considerable make-up or is it better to have a pale apppearance? I am wearing my hair long now just knotted at the back and parted in the midddle and wonder if it would be better not to wear any make-up I am very dark with a clear skin

L E

ANSWER —There are very few skins so perfect that they are not improved by a little make-up Even if you wish to appear pale, use Max Factor s Society Powder However the use of color in the cheeks and lip rouge give the face a more animated appearance For evening wear Max Factor's Liquid Whitening which comes in similar shades to the Face Powder gives a particularly beautiful effect Use Raspberry rouge

DEAR MR FACTOR —Do you just use plain red rouge to give the cheeks a very red jolly look? I am a boy 18 years old quite plump for my height and want to play a comedy part which calls for red cheeks Also—how can I put white whiskers on my chin and make them stay?

ROB

ANSWER —Use Max Factor Moist Rouge No 1 and Dry rouge No 18 White whiskers are made from white Crepe Hair and stuck on with spirit gum Ask for full directions when you buy the crepe hair—I have published a special charr on making whiskers etc

DEAR MR FACTOR —Is there any way other than diet to make the face look less round? Is there any way with make-up that I can change the fat look about my face? I am blonde hazel eyes and weigh about 154 to 5 feet 4 inches

M E

ANSWER —The use of dry rouge will effectively alter the appearance of a full face Place on cheeks rather toward the ears and down toward the jaw bone This will appear to throw the sides of the face in shadow Dress the hair off the forehead and well down on the sides of the face

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PROFESSIONAL AMATEURS

Lon Chaney Trains His Cameras On Celebrities and Cougars "Between Pictures"

By WILLIAM STULL, A. S. C.

Undoubtedly one of the most popular and highly respected of screen personalities, Lon Chaney is universally recognized as the Dean of American actors Living and working as he does in a community where even mediocrity must be outstanding, preeminence such as his is indeed a difficult achievement. Before the camera his diverse and powerful characterizations have won him international fame while among his associates a kindly personality and a keen mind have won unstinted affection and respect Yet despite the success which has been his and the outstanding position into which it has thrust him Lon Chaney has dared to remain himself. Despite the widespread interest which his brilliant achievements have aroused his private life has been resolutely kept a closed book to all save a few intimates Therefore it is hardly known, even among his associates in the studio that Lon Chaney is privately one of the most enthusiastic of amateur cinematographers.

Yet such is the case For a number of years Mr Chaney has spent much of his spare time making personal movies until he now has as large and varied an individual library as there is in Hollywood. In it are to be found intimate personal glimpses of the many famous people who have visited the Metro-Goldwyn-Mayer Studios, informal off the-set scenes of his studio associates familiar family records, and reel up on reel of animated nature-studdies painstakingly made on his many hunting and fishing trips between pictures at the studio

It is of these nature films that Mr Chaney is proudest. Essentially a man's man, he had ranged over most of the west on hunting and fishing expeditions when the acquisition of his first movie camera—a *Filmo*—gave a new interest to the sport. After all, the greatest attraction the sport holds for most of us is the skill and patience needed to secure a passable 'bag'—and Mr Chaney after his first few experiments with a camera found that the skill required to bag an animal with a gun was as nothing compared to the skill needed to bag him with a camera Therefore he bent his energies to the problem of mastering this difficult field of cinematography, to such good pueposes that he has today what is probably the finest collection of wild-life films in Hollywood It includes excellent shots of practically every important Western species from Mountain Lions to Humming-birds According to him, though Humming-birds sound rather tame as a film subject when compared to Cougars, they take quite as much skill to film successfully, due to their small size and ultra-rapid movement and as he has only recently completed a complete reel of nothing but these tiny creatures, he should know. He has also had remarkable success in the photograpby of his many fishing trips which as most cameraists learn, present very considerable and unique problems to cine enthusiasts.

In addition to his original *Filmo*, Mr Chaney also uses a *Victor* camera, whose lens-turret and tri-speed movement he has found invaluable for his animal films For stills he uses a *Graflex* But then," he says, "I don't give the poor thing much of a chance I usually carry both of my movie cameras with me, and between the two of them I seldom have time to think of stills until it's too late to get any!"

"How did I happen to start making personal movies? Well, you know how many world-famous visitors we have had here at the studio, a few years ago I decided that since I had the chance, I'd like to have a real, personal record of these folks Of course movies were the logical form for the record to take—so I bought my *Filmo* Like most other amateurs I found that I'd gotten into something far more interesting than I had expected so I've kept on I've tried almost everything in the line of personal movies, but I think that I get the greatest pleasure out of my hunting films, and, of course, my animated album to which I'm steadily adding

"As for saying anything in the way of advice to the amateurs, why, I'm just an amateur myself: the technicians who write in such magazines as *The American Cinematographer* have certainly told them all I could, and more One thing though, my experience prompts me to say: that is use a tripod! My years of work in the studios before the cameras of the industry's best cinematographers have impressed me with the importance of a good firm support for motion picture cameras Therefore in my own filming wherever I can, I, too, use a substantial tripod and I've found it my most valuable accessory Personally I use a big *Crown* still-camera tripod with one of Fred Hoefner's pan-and-tilt heads on it I'll admit it's a big clumsy-looking outfit but it is rock-steady—which is more than can be said for a lot of lighter ones One other word too particularly to picture people personal movie-taking can be the most fascinating hobby in the world for us, but we can easily rush it to death too There is no reason on earth why we should rush out and try to shoot everything in sight the first week or so we own a camera If we do we're likely to forget it entirely the third or fourth week Taken intelligently and conservatively, though, there is no more instructive nor more enjoyable sport for any of us than amateur movie-making"

Still another feature of Mr Chaney's amateur activities but one which he modestly forbears from mentioning is his success as a missionary of the amateur film movement As his *Filmo* outfit was one of the first to appear among the film colony, it would be difficult to even hazard a guess at the number of famous film people whom he has either directly or indirectly interested in his hobby, but even his reticence cannot conceal the fact that he has



Chaney in action as an Amateur Cinematographer with his Filmo alongside Henry Sharp A S C

Why Wheels Seem to Turn Backward in Motion Pictures

An Explanation That Will Answer Hnndreds of Questions That Reach The Editor's Desk.

By PAUL H. ALLEN, A. S. C.

I BELIEVE that the one question that I have answered more than any other since I have been in the motion picture business is, "Why do automobile wheels turn backward on the screen?" The reason why is simple, but the answer without a diagram isn't so easy But I believe that by referring to the illustrations on this page it will be quite plain, and then all the readers can tell all their friends, and there you are

Of course you all know that "moving pictures" don't really move, but are just a series of individual snap shots showing the successive positions of moving objects But it is just these successive positions which may easily produce the illusion of "wheels turning backward," which quite naturally are going in the right direction- This fact can be illustrated by the diagram (Figure 1) of four-spoked wheels rotating at such a speed that after one picture of the film has been exposed the spoke "A" has turned around just enough to show "A" at the position of "B" when the next picture is exposed It is then quite evident that in a case of this kind, if the spoke and camera keep turning at constant speeds when the picture is projected upon the screen it will appear to be standing perfectly still

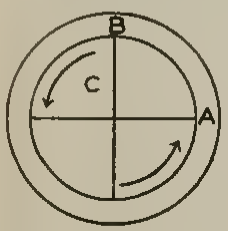


FIG 1

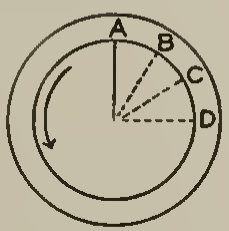


FIG 2

Again the wheels on fast-moving cars often appear as if they were moving backward- This would happen if the spoke "A" had been revolving so fast when it was photographed that the interval between one exposure and the next the wheel revolved all the way around from "A" to "B" (Figure 2). When the next successive exposure was made the spoke appeared at "C" and so on

When this film is projected on the screen the spokes will seem to run backward No matter how many spokes there are in the wheel it is evident that the effect on each one will remain the same and the entire wheel will appear to turn backward at the same speed as that of each spoke

The so called mystery is nothing more than an optical illusion

How can you avoid having it happen in your films?

Several ways if you must show an automobile being driven across the screen in your film, try and select one with disc or wire wheels Or shoot the car from the front or rear in such a position that the wheels do not show on the screen Or let them turn as they may!

Berlin—A series of educational shorts are being produced by UFA Dr Martin Rikli is in charge of the expedition and also edited these novelties "Useful Weeds," has been completed and will soon be ready for release

interested a number of the famous people whom he photographed for his animated album in personal cinematography Highest among these stand H R H Crown Prince Wilhelm of Sweden to whom Mr Chaney presented a *Filmo* and a lasting interest in amateur films and Brig Gen. Smedley Butler, U. S M C who carried a 35 mm DeVry camera the gift of Mr Chaney to China with him, when he went there to command the marine detachment With such achievements in his record Lon Chaney deservedly ranks as high among cine-amateurs as he does among professional actors

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Berlin—Conrad Veidt is completing interiors for The Last Company at the UFA sound studios at Neubabelsberg Karin Evans will play opposite the star



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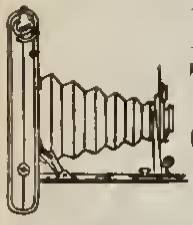
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Storing and Handling Film

(*Continued from Page 20*)

thus attaining a higher temperature

The chemical reactions which take place in nitrocellulose differ with its mode of combustion flameless active or explosive Fortunately, in the last two methods of combustion the reactions are much more complete than in flameless combustion They do not yield nitrous fumes and but little carbon monoxide

Little or no attention has been given to the tendency of nitrocellulose as used in films to undergo spontaneous decomposition which might eventually result in spontaneous combustion and no instance of such an occurrence has been brought to notice in this connection But such occurrences have been very frequent with such nitrocelluloses as are used in smokeless powder and also as are sent into the market in the form of collodion cotton for use in the manufacture of collodion as used in photography and in pharmacy

The decomposition referred to has been found due to the fact that the physical structure of cotton, from which cellulose nitrates are manufactured is such as to make it difficult during the purification processes to remove from the cellulose nitrates the very last traces of free acid Yet if but a minute quantity of free acid remains in the nitrocellulose it reacts to decompose the nitrocellulose, producing as a result more free acid and these reactions progress autocatalytically with the evolution of heat until a considerable mass of the nitrocellulose is involved and the temperature has reached the point of ignition when fire or explosion takes place Provision is made in the case of smokeless powder and some other substances produced from cellulose nitrates to reduce or prevent this decomposition by adding to the mass a neutralizing agent such as diphenylamine to remove the free acid products as they are formed and this procedure has given a measure of protection

At least 75 years ago it had become the established practice in placing long staple pyroxylin or collodion cotton, on the market to pack it in cardboard cartons and in this method of packing the nitrocellulose has been observed to remain for years undecomposed while if the nitrocellulose in these cartons were transferred to tightly stoppered bottles it soon underwent spontaneous decomposition Another cellulose nitrate product which has frequently given rise to disasters through undergoing spontaneous decomposition as packed in tightly closed containers is compressed military guncotton Yet with this as with the collodion cotton it has been repeatedly demonstrated that if the blocks of dry guncotton are freely exposed to the air out of contact with direct sunlight they keep materially unchanged through years

Another characteristic of cellulose nitrates little referred to is their capacity to acquire static charges through friction, yet this is very apparent when one runs the hand through a mass of granulated single base smokeless powder It is easily demonstrated by rubbing a piece of moving picture film when it will attract to itself small bits of paper and other light objects Many ignitions of inflammable and combustible substances have been due to the development and discharge of static charges originating in friction on moving parts but experimental demonstration of the phenomena is attended with many difficulties and rarely succeeds It is significant to find in the newspaper accounts of a recent disaster that observers reported seeing 'the first explosion occur in a pile of chemicals near one of the polishing machines and that the only fatality was that of a man "found unconscious near a film polishing machine

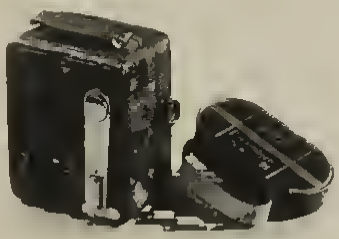
Another feature of film disasters is the nitrous fumes' the brownish-red fumes especially produced during the flameless combustion of the films The nitrogen oxides as evolved from the decomposing film are NO (or N_2O_2) and NO_2 (or N_2O_4) The NO as set free is a colorless gas but on coming in contact with the air it promptly combines with oxygen from the latter to form NO_2 gas which is brownish red in color. It is possible that through the reactions of these nitrogen oxides with the oxygen of the air they encounter other oxides such as N_2O_3 and N_2O_5 are also formed in varying proportions Further the NO_2 reacts with oxygen and water present in the air or that produced in the burning and the N_2O_3 and N_2O_5 react also with water present to form the highly corrosive nitrous and nitric acids

Though NO is but slightly soluble in water NO_2 N_2O_3 and N_2O_5, or the acids formed from them are quite soluble in water, and since NO readily forms NO_2 on contact with air it is a simple matter to remove "nitrous fumes from the atmosphere by spraying the atmosphere with water Furthermore a proper supply of water will quench fires in nitrocellulose films

The Kinamo S.10

THE amateur movie enthusiasts of the United States will enjoy the special feature of the little Zeiss Ikon Kinamo S 10 a thoroughly practical 16 mm outfit which is the smallest existing movie camera made Kinamo S 10 is distributed by Carl Zeiss, Inc 485 Fifth Avenue New York City.

The Kinamo S 10 is equipped with a Carl Zeiss 2 7 Tessar lens. The camera is small enough to be held easily in one hand and, with the eye applied to the internal view finder, may be satisfactorily braced in this way Threading is quickly and effectively accomplished with the aid of a special container which simplifies placing the film in the correct position and eliminates threading the take-up reel Feed and take-up sprocket are arranged in remarkably compact form A special feature is the movable feed sprocket by means of which the size of the loops may be changed after threading The film magazines are furnished loaded with 33 feet (10 meters) of 16 mm Eastman Kodak



safety film, orthochromatic or panchromatic a very convenient length which enables the amateur to take a few complete "shots" using all of the film and thereby getting quick developing service. After the film is exposed it is automatically wound in the light tight container ready for shipment to the nearest Eastman Kodak processing station. A novel and useful indicator shows at a glance just how far the spring motor has run down and when it is necessary to rewind By using this device, the operator may appear in the picture for a given length of time, after which the camera will stop automatically One full winding of the spring-motor exposes 13 feet of film The design of the Kinamo S 10 is such that it is exceptionally easy to keep the gate free from the emulsion deposits All working parts are enclosed in a dust proof housing and no need exists for cleaning the mechanism

RCA in Alaska

With presentation of talking pictures at the Liberty Ketchikan the first of seven RCA installations for Alaska has been made it is announced by RCA Photophone Inc

Editorial Board Named for Cinematographic Annual

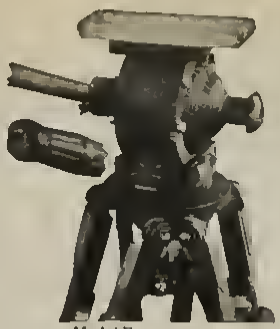
PRESIDENT JOHN F SEITZ of the American Society of Cinematographers has announced the following as the members of the editorial board of the Cinematographic Annual Paul Allen, John Arnold Herford T Cowling, Emery Huse Victor Milner, William Stull and Ned Van Buren

This board will assist Mr Seitz and Hal Hall editor in the work of editing and compiling the Annual which it is expected will be the most important technical book that has been published in connection with the motion picture industry One of the most outstanding and representative groups of authorities in their various lines is preparing the editorial content for this book In this group are the most noted men of the industry

Fires actively under way in compressed military guncotton even have been extinguished with water applied to them

A set of regulations governing the storage of nitrocellulose films has been drafted by the National Fire Protection Association Central Street Boston Mass

TRUEBALL TRIPOD HEADS

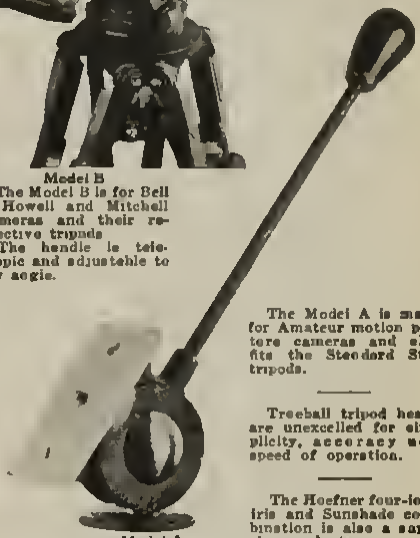


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Amateur Movie Making

(*Continued from Page 35*)

the fire as the sole source of light or with a few reflectors or diffused lamps to give a relieving front light

Night Sports

Magnesium flares however are primarily intended for exterior use, for they are rather too closely related to Fourth of July fireworks to be safe indoors Used outside however, they offer great possibilities What picturegoer, for instance has not seen and enjoyed the perennial newsreel shots of night winter sports such as tobogganing figure skating etc made with the aid of those handy torches? With only a few flares the amateur camerist can do quite as well himself Place one for instance on a toboggan coming down a sporty course where the camera is able to follow for some distance, around curves through trees and so on, or place both flare and camera on the toboggan with perhaps another flare managed by an assistant in the ground at some particularly thrilling curve If the assistant can use a camera at the same time, so much the better Similarly attaching a flare to a night flying ski-jumper would undoubtedly give an unexcelled spectacle—but the problem of persuading a skier to attempt it would I fear be beyond most of us'

And—the Real Bright Lights

Now that super-speed lenses are becoming so much a part of every amateur's equipment artificial lighting equipment for exterior night scenes is by no means always a necessity Amateurs in the larger cities can easily take advantage of the lighting kindly furnished by the municipality and the local merchants Street scenes by the ordinary street lights are now familiar parts of many amateur libraries but they are newly attractive when a camerist is lucky enough to be able to shoot them after a heavy fall of soft snow In such cases, even the possessor of relatively slow lens equipment can benefit for the fresh snow is an excellent reflector and between it and the half-speed movement on the camera even staid old fashioned F 3 5 lenses acquit themselves surprisingly well

Free Book on Society Make-up by Max Factor

THOSE women who admire the faultless beauty and alluring charm of the picture stars now have the opportunity of learning how they have mastered the art of make-up to such a perfect degree

Mr Max Factor international authority on make-up has prepared a small book on society make up for the especial use of women not of the screen It is an unusual book with a wealth of information that should be invaluable to all women who want to know how to use their make up correctly This book is free for the asking Either write care of *The Cinematographer*, or direct to Max Factor, at his Highland Avenue Studio Hollywood and the book will be mailed you

High Ireland Duty

TALKING PICTURE equipment imported into Ireland has been made subject to a customs duty of 33 1-3 per cent according to advices reaching the M P Division of the Department of Commerce This will advance the price of apparatus sold to Irish exhibitors and is regarded as a move to discourage the exploitation of talking films in Ireland

New Sound Device

KINOPLAY CORPORATION makes its entry into the synchronized equipment field with a new sound-on film apparatus intended to serve the needs of exhibitors who desire a low-priced equipment Kinoplay according to its manufacturers will reproduce film recorded through either variable or fixed densities Another feature claimed for the apparatus is that, in running silent pictures the film does not have to be threaded entirely through the sound on-film mechanism The film passes into the lower magazine on a sliding roller without additional sprocket wear

Nice—The Casino de Paris here has been opened as a talking picture house

Of Interest To Amateurs

Mother's Day

NEXT month s tssue of the *Cinematographer* will contatn an offering which we feel will be of unusual merit and practical use February is a long way from May, but the offering will be a practical scenario or working script for a picture built around Mother

Most people give flowers on Mother s Day But we suggest that a film entitled Mother's Day", be given them in addition to flowers tbts year Loretta K Dean, who has contributed several interesting arttcles to the *Cinematographer* has prepared this scenario and we would be pleased to hear from all our readers who use it Watch the February tssue If you like the tdea, we will run a scenario each month The Editor

Around the World

WIll IAM F DOUGI AS of Elmhurst Ill ts one of the greatest boosters of the 16 mm camera The reason ts that he made a trip around the world last year and shot 4000 feet of film with his DeVry Now he is maktng the same trip every once in awhile—only tn the easy chair of hts Ivtng room

Modern Ages

THE Untversal Motion Picture club of Paterson N J ts maktng an ambitious photoplay entitled Modern Age' Walter Nowatka ts directing and handling the camera

Interior Shots

NOW that winter has brought its long eventngs to home movte makers in most of the United States and snow ts neaped up tn huge drifts outdoors it is the time to make those tndoor shots you used to dream of last summer Maybe next wtnter Grandma may not be with you so get out that Sunny Twin lamp and your camera and make the shots that in years to come will be treasured by you

Lighting Book

IF you haven t wrttten to Westphalen of Chtcago for his free book on tnterior lightmg we d advise that you do it now There ts much you will learn tn the little book prepared by this expert on amateur lighting

The World's Fastest Plate

CINE AMATEURS who are also devotees of ultra-speed still photography will be tnterested to learn that the enterprtsing English firm of Ilford l td have placed upon the market what is undoubtedly the most amazing of all their celebrated creattons tn ultra-fast plates The astonishing speed of 1400 H and D is their claim for their new *Golden Iso Zenith* emulsion whtch despite tts extreme speed is reputed to be remarkably fine grained and acceptably isochromatic Since the speed of the average amateur film ts between 300 and 400 H and D the terrific speed of the new emulsion is almost tnconcetvable

New Dallmeyer Lens

WE LEARN from a Brtttsh contemporary that the famous Optical Speed Merchants the Messrs Dallmeyer, of London have agatn surpassed themselves Their latest creation ts a one tnch ctne lens working at the amazing aperture of F 0 99 which they point out is *twelve times as fast as the familiar F 3 5 fitted to most amateur cameras* The lens is now regularly on the Brtttsh market being supplied in standard mounts fitting Filmo, Victor and Ensign cameras at the comparattvely reasonable price of 20 pounds sterling At the present time tt ts probably not yet available tn Americe but no doubt tt soon will be

Winter Clouds In "Pan"

THI best way of getting good cloud effects ts through the use of Ctne Kodak Panchromatic Safety Film and a filter However a filter is not essential and Pan will give surprising results without one

New High School Club

Organized for the study of Cinematography a club has been started at the John C Fremont High School Los Angeles C A Bach sponsors the club which shoots 400 feet of film each Term using a professional Bell & Howell Sound is also studied Fifteen members comprise the present roster

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Principles and Processes of Photography in Natural Colors

(*Continued from Page 24*)

remained in contact a short time, the film support is stripped off, the operation usually being carried out under water The yellow tissue is ordinarily mounted first, then the blue-green, and then the magenta Some of the finest examples of this process produced in America are those of J W Allison of New York

In the original Raylo process introduced in 1923, three exposures were made successively and automatically on one plate through the three primary filters, yielding a negative The method of printing gave any number of 5 by 7 inch pictures on paper and is a novel application of the carbon process A sheet of film base coated with three patches of pigmented gelatin was stretched in a frame exposed to the enlarged images of the negative as shown in Fig. 12 and then developed in the usual way in hot water By means of a special registering device, the final superimposition of the three tissues was claimed to be accomplished with ease More recently the inventor of the Raylo process Mr H C J Deeks, has supplied prepared pigmented aceto-cellulose sheets in three colors for printing from any set of three-color negatives Each sheet is coated with a light sensitive silver halide emulsion containing the pigment After exposure and development in a tanning developer the relief image is washed off in hot water and the silver image is removed by bleaching and fixing The prints on these pigmented tissues are then transferred to a paper support

In the Ozobrome method bromide prints made from the original three-color negatives are brought in contact with the respective color tissues soaked a short time previously in a bichromate-ferricyanide-bromide bath, and the bromide print stripped off the tissue which now bears the image of the print The tissues are then developed, fastened to a temporary support brought into register and finally transferred to a permanent paper support.

(iii) Imbibition Processes. Color prints by the imbibition process are made by starting with a blank sheet of gelatin coated paper and causing the coating to take up successively or "imbibe" dyes from color images from the "print plate" covered with unhardened gelatin Any number of prints may be made from one group of print plates. The dyes used in this process will only stain soft gelatin In another imbibition process the Sanger-Shepherd, the reverse is true since it depends on dyes which will stain hardened gelatin Very pleasing results may be obtained with both two and three-color imbibition processes

(iv). Relief Processes A novel wash-off relief process using imbibition to prepare the final print was introduced in Germany in 1925 under the name "Jos-pe" Printing plates were prepared from a set of three-color negatives by projection onto glass plates coated with a gelatino-bromide emulsion The plates are exposed through the back and developed in a developer which differentially hardens the gelatin according to the amount of silver image formed A relief image is obtained by washing the fixed-out plates in hot water Prints are made from these simplified since the printing plates are quite transparent

(v) Bleach out Methods An ingenious method for changing a color transparency into a color print which unfortunately has thus far had very little commercial success is the bleach-out process first worked out by J. H Smith in 1895 and known as "Utocolor" This process had been suggested in 1867 by Du Hauron and Charles Cros from purely theoretical reasoning It depends on the property certain dyes possess of bleaching out when exposed to specific wave-lengths of light. Paper is coated with an intimate mixture of three such dyes, red yellow, and blue The color transparency is placed in contact with the paper and by virtue of the bleaching properties of the dyes the paper is changed into a color print Uneven bleaching distortion from heat and fugitiveness of the dyes are some of the difficulties encountered Although these limitations are serious, this method offers great possibilities if it is ultimately worked out satisfactorily

(vi) Three and Four Color Photo-mechanical Reproduction The most outstanding use of color photography for many years has been the making of three-color reproductions in books and magazines by photo-mechanical methods Two methods are used, depending upon the accessibility of the subject, (a) the Indirect and (b) the Direct methods.

In the former, three-color separation negatives are prepared, transparencies are made from these negatives and screen negatives on wet collodion plates are finally obtained from the transparency by interposing in the camera in front of the sensitive photographic plate, a glass plate evenly ruled with a fine cross line screen (about 150 lines to the inch)

The Direct method avoids the making of the first negative and the transparency since the three screen negatives are made by direct photography of the colored subject For each separate screen negative, the red blue and green the screen is rotated making each pattern at an angle of 22½ degrees to 30 degrees from the others When the lines of the screen cross at smaller angles a disagreeable pattern or moire is produced in the final printing Engraved copper color plates are prepared from each color separation negative and printed by inking up with suitable greasy ink pigments

(b) Two Color Subtractive Processes Several two-color processes for preparing color prints have been worked out using most of the methods described under three-color processes Very pleasing results have been produced with two-color imbibition and by carbon transfer methods

(To be Continued Next Month)

Develops Cin-ex Camera

Detroit—A motion picture camera known as the Cin-ex, by which a variety of bodily functions such as the motion of the lungs and movements of the heart and intestines may be observed has been developed by Dr Jarre of Grace Hospital here

Sonora Home Talkies

TALKING PICTURES for the home reproduced by a machine that aso can be used as an ordinary radio receiver, have been demonstrated by the Sonora Products Corporation in its private projection room in the Sonora Building The apparatus, invented by Sonora engineers, is said to be the first of its kind It uses ordinary 16 mm films, capable of throwing a picture five feet square, while the talk is reproduced by a synchronized record

Quantity production is expected to get under way shortly with the facilities of different picture studios being engaged for the making of the films

New Seats for Talkies

AMONG the many problems created by talking pictures for theatre builders and operators is the question of seats with a back made of such material that it will absorb and not throw back the sound waves In legitimate theaters it has been found a number of empty seats will noticeably affect the echo problem, but theater men got around this by using seats that were scientifically upholstered This practice now is being adopted generally in talker theaters with a thick velour being favored

New Camera Device

A DEVICE designed to control six cameras simultaneously with rheostatic starting to eliminate jamming of the motors has been invented by William Johnson chief electrical engineer at Radio Control of markers, which show the starting and stopping of the player's action as well as governing stop lights and signal bells which give warning throughout the entire studio that quiet must prevail are other features

Device is especially adapted to photographing large sets where more than two cameras are used to get all the action from different angles at the same time

Non-Stop Projector

KLANGFILM in association with A E G, powerful German electrical trust, soon will introduce to the trade in Germany a new non-stop projector designed to solve the problem of intermittent projections which causes the damage of sprocket holes according to a report to the M P Division of the Department of Commerce, at Washington

The A E G projector makes use of a series of mirrors in which it is claimed 100 percent of the light is transmitted, none being wasted by the interception of a shutter Each of the mirrors turn on its axis as the film travels through the camera so as to keep the image of each picture reflected in the center of the mirror which moves into place one after the other

The projector already has been installed in several theatres for experimental purposes and an attempt now is being made to market them on a wholesale basis

Berlin—Two animal pictures, "A Day With an Indian Elephant" and "From Gnat to Elephant" have been completed by UFA for educational purposes

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New Hollywood Lab.

Leonard Pool and Bud Hooper of San Francisco have established a new film laboratory in the building recently vacated by Smith and Aller distributors for du Pont film

It is being operated as the Afient Laboratories catering to general production work

Paris

Motion pictures showing actual fire scenes at various stages are being collected by the Paris fire department to be used in teaching firemen how to combat these emergencies and also in educating the public along the lines of prevention

London

S M Eisenstein the Russian director, has concluded a course of lectures on the technique of motion pictures given under the auspices of the Film Society

Paris

Plans for the production of three talking pictures are announced by Mme Marie Louise Iribe Father Lancelot s Three Daughters ' will be the first

The King of Jazz

(*Continued from Page 6*)

And then Whiteman came to silent pictures

I believe there will be some great silent pictures made in the future ' he declared "Some stories lend themselves to silent pictures and they should be made silent Then there are people like Chaplin who should stick to silent drama I hate to think of Chaplin turning to talkies He is so magnificent in pantomime, a master at it, and I think sound would spoil a lot of the wonderful charm of his work

Again he referred to cinematography with more boosts for the cameraman and their work "Marvelous simply marvelous." he declared "What they can t do with a camera cannot be done '

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Fisher Ross G —Fox
Fildew William—
Flora Rolla—Fox
Fryer Elmer—
Ferrers C Curtis—Fox

Gilks Alfred—Paramount
Gray King D —Thunder Bay Film Ltd
Guistart Rene—Elstree Studios England
Good Frank B —Warner Bros
Gaudio Gaetano—Warner Bros
Greene Al M —Tec Art
Greenhalgh Jack—F B O

Hallenberger, Harry Paramount
Hilburn Percy M G M
Hyer Wm C —Educational
Horne Piney—
Haller Ernest—First National
Hatton Chas —New York
Herbert Chas W —Fox Movietone New York

Jackman Floyd—
Jackman Fred—Technical Director Warner Bros
June Ray—United Artists

Kershner Glen—First National
Koenrkamp H F —Warner Bros
Kurtle Robt E —Tec Art
Keyer Donald B —United Artists

Lundin Walter—Harold Lloyd Metropolitan
Luckwood, J R —
Lang Chas B —Paramount
Lanning Reggie—M-G M

Lindon Curly Paramount

Marsh Oliver—M G M
Miller, Arthur—Pathe
Mohr Hal—Universal
McDonell Claude—London England
MacWilliams Glen—Fox
Morgan Ira H —M G M
Milner Victor—Paramount
Marta Jack A —Fox

Nogle George G —M G M

O Connell L Wm —Fox

Parrish Fred—Colorado Springs Colo
Pable, Ted—Pathe New York
Palmer, Ernest—Fox
Powers Len—
Perry Paul P United Artists
Perry Harry—Caddo Prod
Polito Sol—First National
Pomeroy Roy—

Roos Len H —Sound Dept. Cinema Equipment Co
Rose Jackson J —Tiffany
Rusher Chas —Elstree Studios England
Ries Park J —
Ritchie Eugene Robt —Leasky
Kers Wm A —Warner Bros Vitaphone

Schoenbaum Chas —Technicolor
Stengler Mack—F B O
Stevens George—Hal Roach
Struss Karl—United Artists
Stamar John—Universal
Stumar Chas —Berlin-Germany
Stinzenich Harold—Bombay
Sharp Henry—United Artists Doug Fairbanks
Schneideman Geo —Fox Movietone
Scott Homer A —
Seitz, John F —First National
Snyder Edward J —Metropolitan
Shearer Douglas G —M-G-M
Stull Wm —
Smith Jack—Bangkok Siam
Smith Jean C —

Tolhurst, Loura H —M G M
Tappenbeck, Hatte—Fox

Van Trees James—
Van Enger Chas J —Fox
Van Buren Ned—Eastman Kodak Co, Hollywood
Van Rossem Walter J —

Wagner Sidney C —Fox
Walker Joseph—Fox
Walker Vernon L —Warner Bros
Wrigley Dewey—Metropolitan
Wyckoff Alvin—United Artists
Wells Conrad—Fox
Wenstrom, Harold—
Whitman Phil H —
Wilky L Guy—
Warrenton Gilbert—Universal
Williams Frank D —
Westerberg, Fred—United Artists
Young, Jack R —M G M
Zucker Frank C —Photophone, New York

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